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Scheduling in Fog Computing: A Survey

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Abstract- Fog computinggives computation,capacity and arrange administrationsforgreatcreating. Be that asitmay,in an awfully greatmanufactory, the errand demands, terminalgadgetsandmistnodeshaveterriblyvigorousheterogeneousness,justlikethedifferentassignmentcharacteristicsofterminalhardware:blamelocationerrandshavetallperiodrequests;generationprogrammingassignmentsrequireanlargerthanusualamountofcalculation; stock administration assignments require a enormous amount of space for puttingaway, and so on. moreover, the haze hubs have totally diverse handle aptitudes, such vigorousmist hubs with right keen computing assets will encourageterminal instrumentallytowrapupthe complicated errand prepare, like creating examination, blame location, state investigation ofgadgets, and so on. Fog computing gives a disseminated framework at the sides of the organize,driving to low- latency get to and speedier reaction to application demands. With this modernlevel of computing capability, modern sorts of asset assignment and administration is created torequireadvantageoftheHazefoundation.

Key Words- Fog Computing, Distributed Infrastructure, Network, Applications, ComputingCapacity.

1. INTRODUCTION

In computing, programming alludes tothe strategy of distributing computing assets to relatedegree application and mapping constituent components of that application onto those assets, soas to fulfill beyond any doubt Quality of Benefit (QoS) and asset preservation objectives. theapplyingitselfmaymoreoverbeportrayedorconcretekindvictimizationtotallydiverseprogramming primitives like forms, strings, assignments, occupations, workflows, Petri nets, andso on. Additionally, the computing asset seem to be various, beginning from local centers andprocessors on a number, to dispersed asset like hubs in an awfully cluster, virtual machines (VM)in a really cloud, edge or versatile gadgets in an internet of Things (IoT) planning, or desktops ina really volunteer computing arrange. QoS for the applying, like their inactivity, and preservationobjectives,likeminimizing the quanta of asset or their vitalityimpression, will moreover bewont to confirm the plan. Subsequently, analyzing application programming needs U.S.A. toknow the behavior of the computing assets, application models, relate degreed QoS objectives inan coordinatesway.With thequickadvancement of rising innovations just like theweb ofThings(IoT),giganticinformation andcloudcomputing ,thefinancialtransformationhasentered the flawed organize four.0, and creating modes have moreover entered the intelligentcourse. rising technologiesunit wide utilized within the cleverly plant; over all, an curiouslylarge amount of IoT instrumentally is conveyed inside the brilliantly plant, analyzing and handlegiganticsumsofinformationthatpresentchallengestocloudcomputing.Considering theimpediments of cloud computing, fog computing isutilized to resolve the method of periodassignments inside the Mechanical IoT. the foremost refinement between haze computing andcloud computing is that mist computing will provide moo inactivity computing administrationsfor

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terminal gadgets, that's set by the haze hubs sent at the arrangement. Fog hubs unit in somecasesconveyedcircularttheterminalgadgets,andinsomecasesthroughonehop,t heywilltotalinformationsending,enormouslylesseningthedatatransmissiondelay;but,thisadvantagecan't beaccomplishedwithcloud computing.

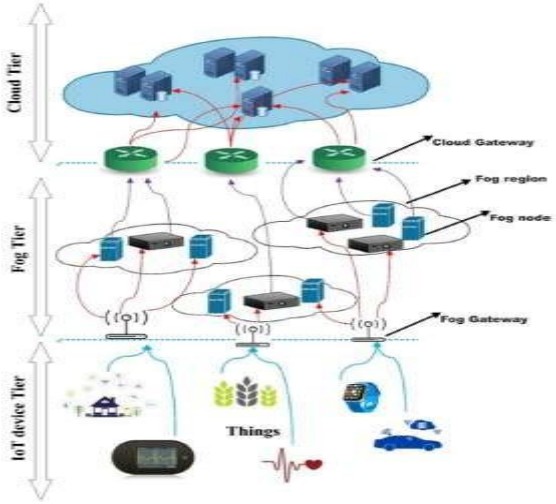

Fig.1Threelayerarchitecture:enduser/fog/cloud

2. FOGCOMPUTINGOVERVIEW

Definition

There unit of measurement numerous terms the same as haze computing, like versatile cloudcomputing, versatile edge computing, etc. Underneath we have a propensity to legitimize each of them.

1) Local Cloud: local cloud may be a cloud inbuilt a neighbourhood arrange. It comprises ofcloud-enabling bundle running on neighborhood servers and to a extraordinary degree supportsinteraction with blocked off cloud. Adjacent cloud is complementary to blocked off cloud byrunningcommittedorganizationsregionallytoinvigoratetheorganizationofdataassurance.

2) Cloudlet: Cloudlet is "a data center in a very box",that follows cloud computing worldviewin an extremely a portion of centered way and depends on high- volume servers. Cloudlet centersa parcel of on giving administrations to delay-sensitive, data degree confined applications inneighbourhood.

3) Versatile Edge Computing: Versatile edge computing is inconceivably the same as Cloudletbutthatit'sfundamentallysettledinportablebasestations.

4) MobileCloud Computing: Mobile cloud computing (MCC)is relate degreefoundationwherevereachinformation capacity andpreparinghappenexteriorof portablegadgets,byoutsourcing computations andinformation capacity from versatile phones to cloud. With theslantofpushingcloudtothesting,MCCbeginstoadvancetoportable edgecomputing.

5) FogComputing: Fogcomputingismoreoftenthannotthought-about asanon-trivialexpansionofcloudcomputingfromthecenterorganizetothestingarrange.offersacomprehensive definition of mist computing, that emerge from challenges and advances which isable frame the mist, with push on a few exceptional properties, like prevalence of remote get to,heterogeneousnessandtopographicaldissemination,sand-boxedenvironmentandflexiblecapacity, and huge scale of hubs. Be that as it may, current definitions area unit all created fromtotally diverse sees and so not common.for occurrence, though' quality comes 1stin edgecomputing, we have a inclination to do not basically slim it all the way down to portable edgecomputing.

3. ALITERATURESURVEY

Scheduling is that the best use of CPU time and correct allocation of resources to programs. themost task of the hardware is to make your mind up that strategy to run inside the another step byhaving a bunch of appropriate forms. The programminggoals exemplify esteem, make span,work

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maximization, VM utilization, vitality, utilization, reliableness, mindfulness and security,mindfulness. Haze computing incorporates open IoT application parts running inside the clouddata middle that's, in switches, switches, intermediary servers, set-top boxes, great portals, basestationsorelectivemistgadgets.Itgrantslocation-awareness,qualitybolster,settingmindfulness, conveyed data analytics, period of time intelligent, interface heterogeneousness,quantifiabilityandcapacity tobargainwithneeds oflatency-sensitiveapplications.On theinverse hand, since of the changeability of asset heterogeneousness and energetic transactions,greatly variable, and unusual of mist organize, it needs the asset administration together of thetroublesome issues to be self-addressed to amplify the haze computing strength. For the leftoverportion of this area, we have a propensity to starting uncover transitory outline three-tier plan ofhaze scene, which we at that point depict afew associated audit andstudy pondersinside theasset administration issues on the mist and edge computing. the net of Things (IoT) is one amongthe imperative changes in data and correspondence advancement The IoT and its associateddevelopments, for occasion, machine-to- machine (M2M) development, grow the net arrange past standard sensible contraptions like cell phones, tablets to relate different scope of contraptions,and customary things (for illustration objects, machines, vehicles, structures) to play out relatecombinationoforganizationsandapplications(forillustrationsocialwelfare,medicinetreatment, control, essentialness the board, transport frameworks organization). These relatedcontraptions area {unit} making associate exceptional degree of information, that need to be putabsent, arranged, and stone-broke down for determinant beneficial bits of data indeed as legallygottentobywrapupbuyersorsurelyclientapplications.TheIoTanditsassociateddevelopments, for occasion, machine-to- machine (M2M) development, grow the net arrange past standard sensible contraptions like cell phones, tablets to relate different scope of contraptions,and customary things (for illustration objects, machines, vehicles, structures) to play out relatecombinationoforganizationsandapplications(forillustrationsocialwelfare,medicinetreatment,control,essentialnesstheboard,transportframeworksorganization).Theserelated contraptions area {unit} making associate exceptional degree of information, that need to be putabsent, arranged, and stone-broke down for determinant beneficial bits of data indeed as legallygotten to by wrap up buyers or surely client applications. in conjunction with it, the number andthus themeasureof organizationsandapplicationsareaunit expandingrapidly,which canrequire dealing with abilities past what can be advertised by the first prevailing quick gadget. Atthat point, dispersed computing, inside which {dynamically progressively more related more}flexible and routinely virtualized resources area unit given as an organization over the net, maygive an gigantic supplement to IoT. The inborn controls of light- weight savvy contraptions (forcase battery life, making prepared control, reposting restrain, plan resources) may be calmed byoffloading strategy genuine, quality eager endeavors up to an incredible computation arrangeinside the cloud, deed essentiallyfundamentallivelihoods to the constrain influenced sharpcontraptions. Be that since it may, once IoT meets cloud, changed challenges develop. As perinformation Dealingwith Administrations(IHS) Markit organization,theIoT advertisecancreatefrom relate presentedbase of fifteen.4 billion contraptions in 2015 to thirty.7 billioncontraptions in 2020 and seven5.4 billion in 2025.1 With the expected impact inside the sum ofrelatedcontraptions,normalboundtogethercloud-basedstyles,insidewhichprepareandcapability resources unit of measurement accumulated amid a number of endless server ranches,willnot aboutunquestionablyhandletheIoT'sinformation andcorrespondenceneeds anyadvance.

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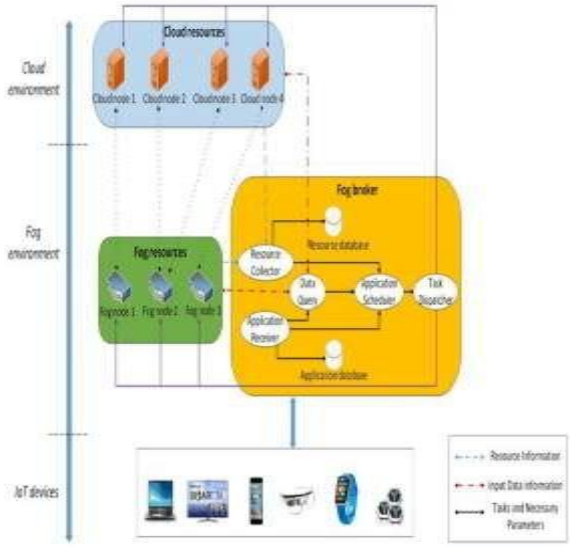

4. RELATEDWORK

In later a long time, a few understudies around the world have conducted examination on hazecomputing,and so themostexaminationheadingsunitfocused on on the definition,plan,application,computingoffloadingandassignmentprogramming.backedtheterminalinstrumented and its request of period of time execution and vitality utilization, the assignmentprogramming of the haze computing demonstrate may well be a vital investigation hotspot. Theerrand programming investigation on mist computing proceeds to be at the preparatory arrange.Yinetal.presentedfogcomputinginsidethecleverlycreatingclimateinsidewhichtheinstrumentedvirtual innovationwas embraced, andthru theerrandprogramming andassetallotmenttoform beyondany doubttheperiodoftimeerrandexecution,thereallocationcomponent to more cut back the computing delay of the assignment was fulfilled. Yang et al.considered the assignment programming amid a undiversified mist organize; they development aspecial delay vitality adjust assignment programming run the show, and decreased the commonbenefittimedelayanddelayunsettlinginfluenceofminimizingthecommonvitalityutilizationat an proportionate time. Pham et al. created the errand programming issues amid a cloud-fogclimate, and anticipated a heuristic-based run the show. Chekired et al. outlined a multilayer hazecomputing plan, inside which they calculated the need of IoT data and assignment demands; atthatpoint,steadywiththeneedconductrank,tallneedassignmentsthat requiredspeedypreparing were obliged by abuse 2 need lining models to total mechanical organize programming andinvestigationof thedata.Liuetal.examinedajointadvancementruntheshowofprogramming different employments and a light way provisioning for minimizing the commoncompletion time amid a mist computing little information middle organize. Bettencourt et al.examined mobility-aware application programming in mist computing. Zeng et al. planned relateconservative assignment programming and asset administration methodology with a diminishederrand completion time for advancing the client skill. Deng et al. examined work programmingtowards worst-casedelay andbestutilityfor asingle-hopFog-IoT plan.A workenergeticprogramming run the show is anticipated, which may maximize the common yield utility thoughensuringtheworst-casedelayoferrandprepare.Chenetal.connectedmistcomputinginnovations for improving the transport arrange, and 2 energetic programming calculations areaunitanticipateduphheldthemistcomputing subjectforthedataprogrammingintransportsystems, inside which these calculations will powerfully adjust to a changeable arrange air andfinish a benefitin power.Zhao et al.anticipated afog-enabledmultitierspecwhichmaydemonstrateaordinarysubstanceconveyanceremotearrange.differentmist empoweredmultitier operations programming approach backed Lyapunov change procedures is created tobreak down the primary troublesome drawback into 2 operations over totally diverse levels. inprofundity reenactment comes about appear the run the show is legitimate and conservative.Wang et

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al. planned a fog computing-assisted great creating framework, and a Software-DefinedIoTframeworkplanupheldhazecomputingwasgotwindof amidagreatworks.relatedescriptive word computing mode choice procedure is anticipated, and machine comes aboutappear that this method are able to do period of time execution and tall reliableness in IoT. Ni etal. anticipated a asset allotment technique for mist computing backed estimated customary Petrinets (PTPN). The methodology comprehensively considers the esteem esteem and time esteem tototalanassignment,anddevelopsthePTPNmodelsoferrandsinhazecomputinginunderstandingwiththe choicesofhazeassets.

5. CHALLENGESINFOGCOMPUTING

Fog computing is taken into consideration since the promising expansion of Cloud computing worldviewto handle IoTassociatedissuesatthestingofarrange.Bethatasit may, in Fog computing, machine hubs unit of measurement heterogeneous and dispersed. Other than, Hazeessentially based administrations need to change totally distinctive angles of constrained setting.Affirmation of security in addition transcendent in Mist computing. Analyzing the alternatives ofHaze computing from auxiliary, benefit homeward-bound and security sees, the challenges amidthisfieldisrecordedastakesafter:

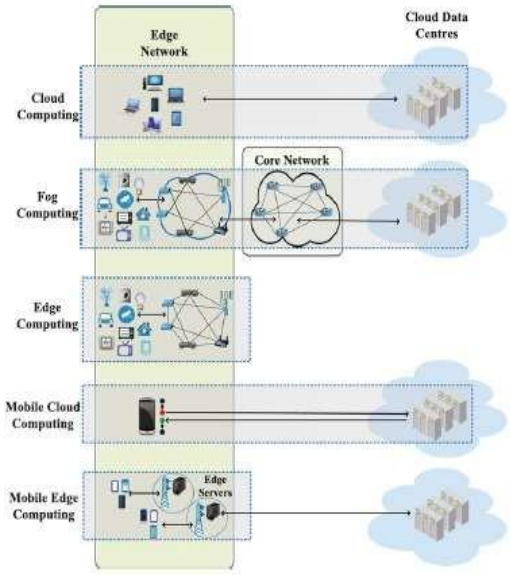

Fig.ComputationdomainofCloud,Fog,Edge,MobileCloudandMobileEdgecomputing

Structural issues

- Completely distinctive componentsfrom each edge andcenter arrangeis utilized aspotential Haze computing foundation. ordinarily these components unit of measurementprepared with shifted assortments of processors be that asit may do not appear to beutilizedforcommon reason computing.Provisioningthecomponentswith commonreasoncomputationotherthantheirold exercisesarehorrendouslydifficult.
- Supportedoperationalnecessitiesandexecution setting,thechoiceoffittinghubs,comparingassetsetupandplacesofpreparingunitofmeasurementexception allyimperativeinHazeBenefithomeward-bound.

Serviceoriented

- Not all fog hubs unit of measurement asset improved. Hence, gigantic scale applicationsimprovementin asset constrainedhubs donot appear to bevery direct comparedtoconventionalinformationcentres.inthemidstofthiscase,potential programmingarrange for conveyed applications headway in Murkiness unit of estimation required to bedisplayed.
- Arrangementsto communicate machine errands and organizations among IoT

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devices/sensors, Haze and Cloudestablishments unit of measurement required to benominative. data visual picture through web-interfaces besides are strongly tomoldinFogcomputingSecurityperspectives.

Securityaspects

- Since Haze computing is pointing upon ancient organizing components,it'sincredibly atchanceofsecurityattacks.
- Verifiedget to toadministrations andupkeep of security in an exceedinglyfor the mostpartdisseminatedworldviewlikeMistcomputingsquaremeasuredifficulttoform beyond anydoubt.
- Usageofsecuritycomponentsfordata-centricjudgmentwillhaveanimpactontheQoSofMistcomputingto agreatdegree.

S.No	Authorand Year	Algorithm /Technique	PerformanceMetrics	Drawback
1	Cardellini et al.2015	implements the system'sscheduli ngalgorithmpolic y	evaluatedthedistributedquality ofservice(QoS)parameters(e.g.networ klatency),awarescheduler for data streamprocessing(DSP)operating	complexfogtopologies thatinvolvemanyoperators may causesomeinstabilitythatcand ecreasetheDSP application'savailability
2	Yanguiet al.2016	Heuristic-based	End-to-endDelay	• Lack ofdifferent weightingparameters • Energy consumptionandcosthave notevaluated
3	Guetal. 2017,18	two-phase linearprogrammin g - basedheuristicalg orithm	communicationcost, applyfor cellularnetwork	nocomputational offloadingcapability
4	Selimiet al.2019	Heuristic-based	Responsetime,Bandwidth	Lowscalability, Latencyhasnotevaluated
5	Oueiset al.2015	reduced complexitytasksc heduling &heuristicalgorit hm	addressedtheissueofload balancing,improveusers'quality of experience (QoE).usersatisfaction,tasklatency,po werconsumption	highcomplexityfor largescalefogcomputing infrastructurebecause the algorithmsused(e.g.EDF)ofte ngivegoodresultsforlow dense computinginfrastructures.co mplexity when thenumberofuserrequests increases
6	Mahmud, et al.2018	Heuristic-based	Deployenttime, Deadline,Numberofthefognode	Suitableforlatency-awareIoTApplication,

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				Reducingtheamountof deployment
7	Zeng, etal.2018	Heuristic-based	Energyconsumption	• Lowscalability • Latencyhasnotevaluated
8	Skarlatetal.2017	GeneticAlgorithm	Execution delay, Serviceplacementrate, Executioncost	• Withoutconsiderationofresourcecost
9	Tanejaetal.2017	Heuristic-based	Energy-Consumption,NetworkUsage,ApplicationLatency	Utilizationoftheproposed algorithmhasnotbeenevaluated
10	Lin et al.2018	monkeyalgorithm+geneticalgorithm	Cost	• Latency, energyconsumption, andheterogeneityhavenotconsidered • Lowscalability
11	Velasquezetal. 2016	IntegerLinearProgramming	Latency,Hopcount,Number of servicemigrations	• Energy consumptionhasnot evaluated • Lackofanappropriatesimulation
12	Phamet al.2016	Heuristic-based	CostMakespanTradeoff	• Highworkload executiontime • Lowscalability
13	Yaoetal.2017	Heuristic-based	Deploymentcost	• Energyhasnotdissuaded • The proposedalgorithmhasnotevaluatedinarealcase study
14	Yousefpouret al. 2018	Heuristic-based	Service Delay, Number offogService, Cost	• Energy consumptionhasnot evaluated
15	Brogietal.2017	Backtrackingsearch	Designtime,Deploymenttime,Runtime	Highcomputationalcomplexity • Lackofanappropriatesimulation • Energy consumptionhasnot evaluated
16	Denget al.2016	convex optimization technique,nonlinear	powerconsumptionand computationlatencytradeoff problem.powerconsumption,delay	Suitableforcentralized infrastructure,noteasy to apply to Fogcomputing

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		integers,Hungarianmethod		
17	Minh etal.2017	Heuristic-based	Latency,Energyutilization,Networkusage	Without considerationofresource cost • Highcomputationalcomplexity • Overheadoftheapproach has notbeeninvestigated
18	Rodrigue setal.2018	Heuristic-based	Latency,Energy consumption, Networkusage	• Patient'smobility has not beenconsidered • Highcomputationalcomplexity
19	Souza etal.2018	Heuristic-based	Delay, ResponseTime	• Withoutconsiderationof resourceheterogeneity • Lowscalability
20	Bitamet al.2017	BeesLife Algorithm	CPUexecutiontime, Allocatedmemory	• Staticscheduling • Lowscalability
21	Fan et al.2017	Ant colonyoptimization	Totalprofit,GuaranteeRatio	Hightimecomplexity
22	Tychal asetal.2020	HeuristicAlgorithm	MeanResponseTimeandMeanSystem Utilization	Does not considerLoadbalancing
23	Jamilet al.(2020)	HeuristicAlgorithm	LoopDelay,EnergyConsumption and NetworkUsage	Itleadstostarvationincaseoflargetuple
24	Manju et al.2019	Min-MinAlgorithm	ResponseTime	Centralizedload balancing,Efficientforsmallerclusternodes
25	Gill etal.2019	PSO Algorithm	ResponseTime,NetworkBandwidth,EnergyConsumption,andLatency	Not consideredScalability, Cost,Reliability, andAvailability.Nottested inrealfogenvironment
26	Singhetal. 2019	HeuristicAlgorithm	ResponseTimeandNetworkUsage	HomogeneousArchitecture andCentralizedApplication Placement
27	Sharmaetal. 2019	HeuristicAlgorithm	ResponseTime,SchedulingTime,Load BalancingTime, DelayandEnergyConsumption	Does not considercostandscalability

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28	Mtshalietal. 2019	HeuristicAlgorithm	Energy Consumption,ExecutionTime&NetworkUtilization	Non-Dynamic
29	Gill etal.2018	FogAssistedInformation Model	Latency,NetworkUses,EnergyConsumption	Notverifiedinarealcloudenvironment
30	Yin etal.2018	Container-Based Task Scheduling	ResponseTime,Delay	Computation Timenotconsidered
31	Ni etal.2017	PricedTimed PetriNets (PTPNs)	Makespan,Cost	Deviation in thecalculationofcredibilitydu etodynamicnature
32	Sun etal.2017	Crowd-fundingAlgorithm	Completion Time, SLAViolationRate	The participant isrewarded or punishedrather than the physicalserver
33	Bitam et al.2018	BeesLifeAlgorithm	ExecutionTime,Memory	Static scheduling,Staticfognodes
34	Ningning et al.2016	GraphPartitioningTheory	ExecutionTime	Complexity increaseswith an increasingnumberofuserrequests,andFognodesare consideredhomogenous

Table2:SummaryofschedulingtechniquesinFog

CONCLUSION

we tend to overviewed later improvements, arranging in Haze computing. Challenges in Mistcomputing is specified here in terms of auxiliary, benefit and security associated issues. bolstered the known key challenges and properties, a arranging of Mist computing has conjointly beenoffered. Our arranging classifies and examinations the winning works upheld their approachestowards tending to the challenges. In addition, backed the investigation, we tend to anticipated afewpromisinginvestigationheadingsthatwillbesoughtafterwithinlong-standingtime.

FUTURESCOPE

Planning issues unit of measurement imperative for the adequacy of the system. Our arrangingclassifies and examinations the winning works supported their approaches towards tending to thechallenges. In addition, bolsteredtheinvestigation, we tend to anticipated afew promisinginvestigationheadingswhichwillbe soughtafterinsidelong-term.

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REFERENCES

[1].AmmarAwadMutlag,MohdKhanapiAbdGhani,N.Arunkumar,MazinAbedMohammed, Othman Mohd. (2019)" Enabling technologies for fog computing in healthcare IoTsystems", FutureGenerationComputerSystems, 90, 62-78.

[2]. an Wu , Christoph Rüdiger and Mehmet RasitYuce. (2017) " Real- Time Performance of aSelf-PoweredEnvironmentalIoTSensorNetwork System",Sensors, 1-14.

[3].Babatunjimoniwa,RiazHussain,MuhammadAwaisJaved,SafdarH.Bouk,SeniorMember,andShahzad A.Malik.(2018)"Fog/EdgeComputing-basedIoT(FECIoT):Architecture,Applications,andResearchIssues",IEEEInternetofThingsJournal, 1-33.

[4].Prabal Verma andSandeepK.Sood.(2018) "Fog Assisted-IoT EnabledPatient HealthMonitoringinSmartHomes", IEEEInternetofThingsJournal, 5(3):1789-1796.

[5]. AnandPaul , Hameed Pinjari, Won-HwaHong, Hyun CheolSeo, and Seungmin Rho. (2018)"Fog Computing- Based IoT for Health Monitoring System", Hindawi Journal of Sensors, 2018,1-8.

[6]. LindongLiu ,Deyu Qi, Naqin Zhou, and YilinWu (2018) "A Task Scheduling AlgorithmBased onClassificationMiningin FogComputing Environment", 2018,1-12.

[7]. Manisha Verma, Neelam Bhardwaj, and Arun Kumar Yadav. (2016) "Real Time EfficientScheduling Algorithm for Load Balancing in Fog Computing Environment", I.J. InformationTechnologyand ComputerScience, 1-10.

[8].K.Kishor,V.Thapar,Anefficientservicebrokerpolicyforcloudcomputingenvironment,Int.J.Comput.Sci.TrendsTechnol.2(2014),104–109

[9]. U. Schwiegelshohn, R. Yahyapour, Analysis of first-come- first-serve parallel job scheduling,Proceedings of the Ninth Annual ACM-SIAM Symposium On Discrete Algorithms (SODA),Association forComputationMachinery, SanFrancisco,California,USA,1998,pp.629–638.

[10].K.Kishor,V.Thapar,Anefficientservicebrokerpolicy forcloudcomputingenvironment,Int.J. Comput.Sci.TrendsTechnol.2 (2014),104–109.

[11].B.Kruatrachue,T.Lewis,Duplicationschedulingheuristics(DSH):anewprecedencetaskschedulerfor parallelprocessorsystems,OregonState University,Corvallis,OR,1987.

OFF BOARD ELECTRIC VEHICLE BATTERY CHARGER USING PV ARRAY

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ABSTRACT:

Study on renewable energy based Electric Lorry battery charging system is flourishing in the automobile market in the recent years. The intermittent nature of the renewable resource sources causes the grid linked renewable resource systems for Electric car battery billing applications. Therefore, an Electric Lorry battery charger making use of grid connected PV system is proposed in this paper. Off-board battery chargers need to be very carefully looked at this requirement for quick refuelling created a change in EV billing technology to focus on DC facilities. This theory makes use of fuzzy logic to control energy intake and also EV battery charger utilizing SEPIC as well as BIDC (Bidirectional) converter. The Fuzzy reasoning control is utilized to merge the advantages of stable current control and constant voltage control. Unclear reasoning is appropriate for such executions. This strategy will help design the dynamics of nonlinear systems. Simulink determined as well as executed the solar-power system using photovoltaic cells, DC-DC converters, batteries, as well as fuzzy reasoning controllers.

Keywords: EV, DC, SEPIC, BIDC, PV system.

1. INTRODUCTION

Technical improvement has genuinely altered format and taken brand-new annoying situations to resolve a chain of troubles. Every one year, logo-

new capabilities are delivered to cars. Security structures and manipulate functions absorb electric powered power even if engines are off. Battery p.C. May be placed indoor or outdoor the auto (off-board). An off-board charger is advanced to promote fast charging. This is certainly hundreds just like filling station. It offers an excessive output voltage. This can probable be the suitable desire for industrial use. Implementing this method might in all likelihood damage battery percent similarly to motive excessive energy call for. Due to upgrades in the solid-united states of America digital converters, photovoltaic structures have in reality turn out to be an enormous vacation spot for micro grids that produce electric strength through way of feeding electricity proper into the general grid throughout height hours. Photovoltaic systems may be hooked up in families to deliver charging stations for electric powered vehicles. Battery chargers are mainly cut up proper into unmarried-stage and additionally -degree designs. Single-degree topology has the gain of lower weight, low amount, streamlined layout, and additional overall performance. Battery structures are categorized into 1/2 of of-

bridge, complete bridge, multilevel, and separated AC-DC.

Ever in advance than developing results of greenhouse gases from the same old IC engines reason ecological problems. This paved to the thriving of infection complimentary electric powered cars (EVs) in the vehicle market. Nonetheless, EV battery charging from the application grid will boom the load name for at the grid similarly to in some unspecified time in the future increases the energy prices to the EV proprietors which necessitate the use of opportunity power belongings. Due to limitless and moreover contamination complimentary nature of renewable beneficial aid property (RESs), it could be carried out to bill the EV battery. Hence, RES driven EV can be defined as 'green transportation'. Solar is just one of the encouraging RESs which can be and not using a trouble touched to apply its energy to charge EV battery. Therefore, PV range energy is implemented to bill the EV battery in the proposed device with the assist of power converter topologies. Lithium ion batteries are normally carried out inside the EV because of its excessive electricity density, immoderate

overall performance, light-weight in addition to compact size. Also, those batteries have the functionality of short charging similarly to prolonged lifecycle with decreased self discharge price.

2. LITERATURE SURVEY

They moreover have low danger of explosion if its miles over charged or short circuited. Throughout charging, those batteries want correct voltage manage. For this cause, wonderful electricity virtual converters with voltage controller are utilized for charging EV battery. Because of the recurring nature of the PV variety, there's a call for energy converters to rate the EV battery. Among distinct converters, multiport converters (MPCs) are preferred within the onboard chargers of crossbreed EVs due to its potential of interfacing source of strength and power garage factors like PV selection, ultra capacitors, significantly capacitors, gas cells and batteries with the loads in EV like motor, lighting, electricity doorways and windows, radios, amplifiers as well as mobile telephone charger. The MPCs have the drawback of upward thrust in weight, rate as well as maintenance of the EV as all of the sources are positioned within the EV itself. Additionally, the intricacy of controller implementation will increase in this converter-primarily based EV battery charging gadget. Therefore, an off-board charger is usually advocated in this paper wherein the EV battery is located within the vehicle unit further to PV choice and decrease lower back-up battery financial institution are positioned within the charging terminal or automobile park station. Various converter topologies for off-board charging machine exist inside the literature. Amongst distinct converter topology, the SEPIC converter is desired because of its potential of operating in every increase and additionally greenback modes. It likewise has the advantage of the very identical input and also output voltage polarity, low enter present ripple and low EMI. Nevertheless, throughout reduced sun irradiation and non sunshine hours, there can be a demand for a similarly garage battery financial business enterprise to charge the EV battery. This lower back-up battery monetary group needs to be charged within the in advance commands and additionally discharged in an opposite instructions depending at the solar irradiation. For this cause, a bidirectional converter with electricity float in both commands is called for. The bidirectional converters are identified proper into non-isolated similarly to separated converters. Transformer in the remote converters gives

seclusion which enhances the charge, weight and additionally length of the converter. The foremost problems of EV are weight and size and additionally therefore, non separated bidirectional converters are notable match for this software program.

Santhosh, T.K., Govindaraju, C.: 'Double input double final effects power converter with one-step-in advance manages for crossbreed electrical lorry applications. The quick conversion of automobile device masses to the electrical place name needs a strength converter to interface in among the on-board supply and moreover garage systems with the add-ons. This observes suggests a simplified framework of twin input dual end result (DIDO) with single-stage strength conversion for hybrid electric powered vehicle accent applications.

Shukla, A., Verma, K., Kumar, R.: 'Voltage-hooked up modelling of speedy charging electric powered lorry load thinking about battery attributes': Electric vehicle (EV) assimilation proper into the power grids is enhancing quick. To look at the result of charging of EVs at the move tool, the general public of the literature thought about EV masses as constant strength lots (CPL) which do not stand for the ideal behaviour of those uncertain hundreds. A specific EV lots modelling is created thru identifying the connection in between strength intake with the aid of EV, grid voltage in addition to us of a of prices of fast charging EV masses.

Wirasingha, S.G., Emadi, A.: 'Pihef: plug-in crossbreed electric factor', The capacity of plug-in hybrid electric lorries (PHEVs) to run in electric as well as hybrid modes in addition to their functionality to supplement the energy storage area off the grid have made them at the front-runner in alternative fuel automobile boom.

Kirthiga, S., Jothi Swaroopan, N.M.: 'Highly dependable inverter geography with an unique soft laptop method to remove leakage modern-day in grid-linked transformer an lousy lot a whole lot much less photovoltaic structures' Grid-related transformer an awful lot much less sun inverters are significantly fashionable inside the renewable useful resource market, on account of their high electricity thickness, inexpensive, and excessive effectiveness.

3. AN OVERVIEW OF PROPOSED SYSTEM

The proposed PV-EV battery charger includes a PV variety, a sepic converter, a half-bridge BIDC, an EV battery, a backup battery financial institution and a controller as acquired Fig. 1 The controller is used to create eviction pulses to the sepic converter for acquiring the constant result voltage on the dc net hyperlink. The gate pulses to the buttons of BIDC are likewise created to perform BIDC in increase mode to fee the back-up battery from PV array further to in greenback putting to charge EV battery from

the again-up battery. Additionally, the controller creates the gate pulses to the complementary switches Sa, Sb in addition to Sc. During excessive solar irradiation, all the complementary switches are ON to client interface dc relate to PV choice thru the SEPIC converter, dc relate to the backup battery through BIDC and also dc link with EV battery. When solar irradiation is decreased, switch Sa is turned OFF setting aside the PV choice and SEPIC converter from the dc hyperlink. Whereas the button Sc is shut off to detach BIDC in addition to backup battery from the dc web link, while the sun electricity is insufficient to bill again-up battery. The cautioned gadget runs in 3 settings viz., mode 1, mode 2 and mode 3 as clarified on this area.

Mode 1.

During top sunshine hours, while the produced PV range strength is greater, all the supporting switches are ON to price each EV battery and also backup battery on the same time from PV array with sepic converter and additionally BIDC, respectively. In this setting, BIDC runs in beforehand commands enhancing the dc net link voltage to bill returned-up battery.

Mode 2

Reduced solar irradiation problems further to non-sunshine hours, PV variety energy are insufficient to price EV battery. Thus, the PV selection is separated from the dc link through switching off the button Sa and additionally modifications Sb & Sc get on linking EV battery to the back-up battery via BIDC. In this mode, BIDC runs backwards commands stepping down the backup battery voltage to invoice EV battery.

Mode 3

When PV range power generated is sufficient to price best EV battery, modifications Sa and Sb get on as well as trade Sc is OFF to cut up the BIDC and backup battery financial institution from the dc hyperlink.

Circuit Layout:

Where V Back-up Battery is the returned-up battery voltage in addition to D Increase is the obligation proportion of BIDC in enhance placing and D Buck is the greenback mode duty percentage. The worth of inductors are considered an awful lot less than the crucial inductance values in every beautify and greenback modes to run the converter in change transmission putting to enhance performance.

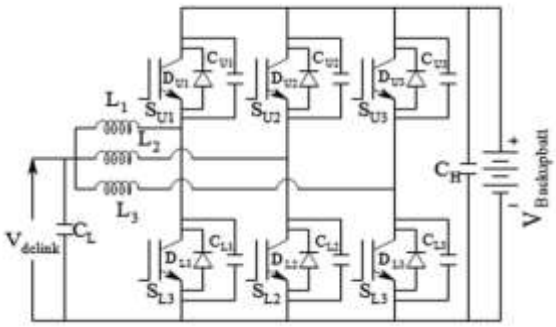

Fig.3.1. BIDC circuit.

OPERATION SYSTEM:

BIDC operates as boost converter in forward direction in this mode, boosting the dc link voltage, Vdc of 28 to 60.6 V to

charge the backup battery with the increase in SOC as presented in below Fig.

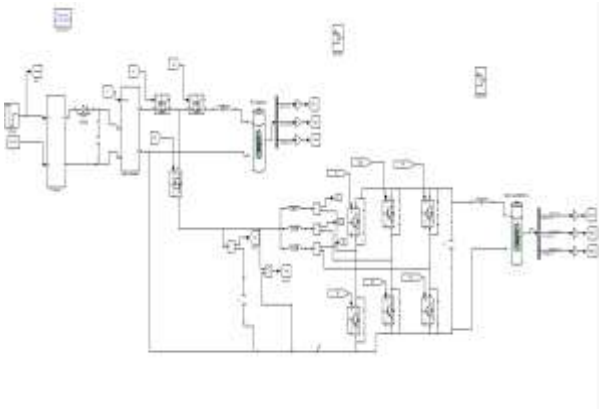

Fig.3.2. Simulation circuit.

In mode 2 (sooner or later of non-sunshine hours and also decreased irradiation problems), PV range is separated important to PV choice voltage, VPV elevating to its open circuit voltage of 37.25 V and additionally PV range cutting-edge, IPV of zero A, it's represented with the aid of the PV range voltage in addition to modern-day waveforms displayed in Fig. Three.2. During this period, BIDC runs in buck putting in contrary instructions, stepping down the backup battery voltage to 27.32 V to price the EV battery as acquired Fig. 3.3.

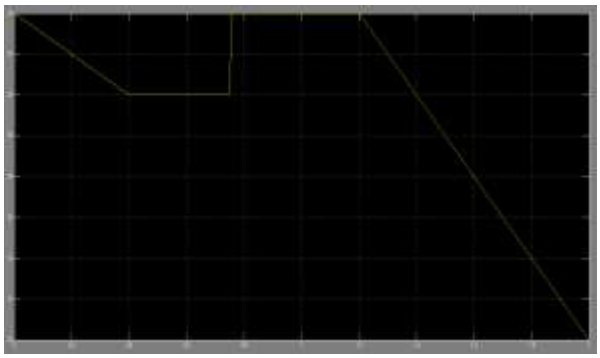

Fig.3.3. PV Voltages across the output.

The great present and minimize in SOC of backup battery proven in Fig. 3.4. shows that the lower back-up battery is launched in this mode. At the give up of this mode the back-up battery voltage is reduced to fifty five.2 V from 60.6 V as portrayed. Whereas in placing three, PV range voltage, VPV of 31.81 V is step all of the manner to a dc link voltage, Vdc of 27.6 V to rate the EV battery.

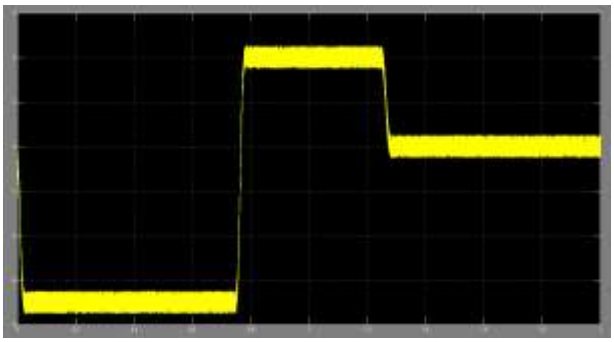

Fig.3.4. Current across the backup battery.

In this mode in addition, SOC of EV battery is boosting and contemporary misbehaves, indicating the charging of EV battery. In mode 3, because of the reality that the back-up battery is separated from the charging tool, lower back-up battery voltage is maintained at its previous expense of fifty five.2 V and present day is decreased to zero.

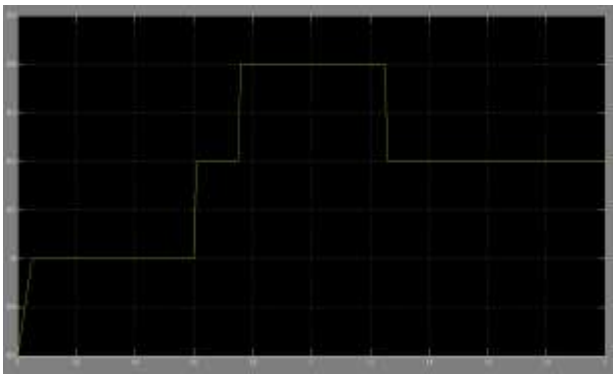

Fig.3.5. Battery Voltage.

The SOC of EV battery is elevating and also its present is unfavourable in all of the three modes showing that EV battery receives charged constantly either from PV variety or from backup battery. The interleaved inductor current waveforms of BIDC in all of the modules operandi. The turnaround of inductor existing glide in mode 2 truly shows that the backup battery obtains discharged in this placing and also no inductor gift inside the putting.

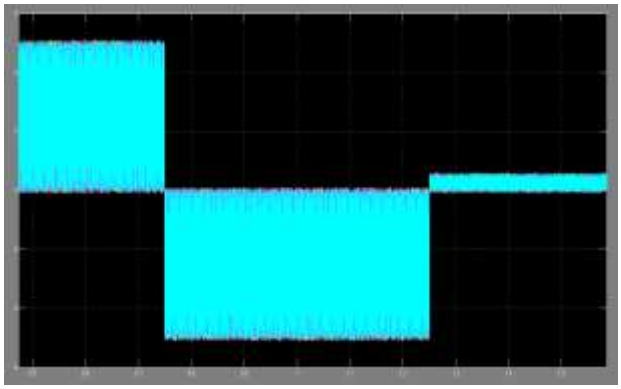

Fig.3.6. 3 Phase currents.

4. CONCLUSION

In this task, an off-board EV battery charging system fed from PV array with blurry is generally advocated. This enterprise talks about the power of the device to fee the EV battery frequently no matter the irradiation troubles. The gadget is created in addition to simulated in Simulink environments of the MATLAB software. The blurry with PV simulation tested in laboratory for the three modules operandi of the recommended billing tool individually and the results are provided. Examination is carried out in RCP approach similarly to the colorful reaction of the device is obtainable each in simulation studies.

REFERENCES

[1] Santhosh, T.K., Govindaraju, C.: 'Twin input dual output sturdiness converter with one-step-in advance control for hybrid electrical powered automobile packages', IET Electr. Syst. Transp., 2017, 7, (3), pp. One hundred 90-- hundred

[2] Shula, A., Vera, K., Kumar, R.: 'Voltage-dependent modelling of rapid billing electric lorry thousands taking into account battery attributes', IET Electra. Syst. Transp., 2018, 8, (4), pp. 221-- 230.

[3] Wirasingha, S.G., Meade, A.: 'Pie: plug-in hybrid electric powered difficulty', IEEE Trans. Vet. Technol., 2011, 60, pp. 1279-- 1284.

[4] Kithira, S., Jodi Saroyan, N.M.: 'Very trusted inverter topology with an particular easy computing method to cast off leakage modern in grid-associated transformer less photovoltaic structures', Compute. Electra. Eng., 2018, 68, pp. 192-- 203.

[5] Bradawl, M.O., Sober, Y.: 'Power flow control of a grid related PV-battery device for electric powered electric powered automobiles charging', IEEE Trans. Ind. Appl., 2017, fifty three, pp. 1347-- 1357.

[6] Van Deer Meer, D., Chandra Moulin, G.R., Morales-Espurna Moulin, G., et al.: 'Energy administration device with PV power forecast to successfully rate EVs on the manage facility', IEEE Trans. Ind. Inf., 2018, 14, pp. 311-- 320.

[7] Xavier, L.S., Cupertino, A.F., Pereira, and H.A.: 'Secondary services ready with the assist of photovoltaic inverters: solitary and three segments manipulate techniques', Compute. Electra. Eng., 2018, 70, pp. 102-- 121.

[8] Kithira, S., Amambay Grounded, N.: 'Examinations of a complicated PV tool topology using multilevel beautify converter and line commutated inverter with solutions to grid problems', Simile. Design. Pact. Concept, 2014, 40, pp. 147-- 159.

[9] Suita, N., Kithira, S.: 'RES based totally completely EV battery charging gadget: an assessment', Restore. Sustain. Power Rev., 2017, seventy five, pp. 978-- 988.

[10] Farina, H., Fotuhi-Firuzabad, M., Moeini-Aghtaie, M.: 'A practical plan to incorporate destruction price of lithium-ion batteries in automobile-to-grid bundles', IEEE Trans. Sustain. Energy, 2016, 7, pp. 1730-- 1738.

[11] Dubai, R., and Ibrahim, A., Sub has, M.: 'Multiinput DC-- DC converters in renewable electricity programs-- an outline', Restore. Sustain. Power Rev., 2015, 41, pp. 521-- 539.

[12] Duong, T., Sajib, C., Yuanfeng, L., et al.: 'Maximized multiport dc/dc converter for cars and truck stress trains: topology and also style optimization', Appl. Sci., 2018, 1351, pp. 1-- 17.

[13] Santos, T.K., Natarajan, K., Govindaraju, C.: 'Synthesis and moreover software of a multi-port dc/dc converter for crossbreed electric powered cars', J. Power Electron., 2015, 15, (five), pp. 1178-- 1189.

SMART WALKING ASSISTIVE DEVICE FOR BLIND PEOPLE

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ABSTRACT:

Vision is a precious gift from God that one can able to see and enjoy this beautiful world. But many people throughout the world are deprived of this. According to October 2017 report of World Health Organization (WHO) an estimated 253 million people live with vision impairment: 36 million are blind and 217 million have moderate to severe vision impairment. Un-operated cataract is the main reason for blindness in low income and developing countries. Even in China by the end of 2017, the population over 60 will reach 241 million, accounting for 17.3 percent of the country's total population and nearly 40 million are disabled and semi disabled, according to data released by the Committee for the elderly in 2018. So, in this case most of the visually challenged people cannot afford an expensive device to use as their supporter. So, in this project we have proposed a cost-effective 3D intelligent Walking device. This is mainly depends on the sensors because Sensors can improve the world through diagnostics in many applications and it helps to improve performance. This device is implemented using ARDUINO Controller, IR Sensors (For 3D),Vibration Sensor (Piezoelectric sensor is for Pressure and Acceleration) as well as GSM and GPS for location Sharing. Also we are introducing Voice module with this to give the directions through audio format. This Entered device is programmed by simple machine learning algorithms to optimize the machine.

Keywords: GSM, GPS, IR sensor, ARDUINO controller, vibration sensor.

1. INTRODUCTION:

Independence is the important methodology in achieving objectives, dreams and goals in life. Visually impaired/blind persons find themselves challenging the dangerous paths to go out independently. There are millions of visually impaired or blind people in this world who are always need the help from others. For many years the normal walking stick became a well-known attribute to blind person's navigation and later efforts have been made to improve the walking stick by adding remote sensor. Blind people have big problem when they walk on the street or stairs using normal walking stick, but they have sharp haptic sensitivity. The electronic walking stick will help the blind person by providing more efficient and convenient means of life. Moving through an unknown environment becomes a real challenge for the blind or impaired people. Those who go out from the house with the white stick, often use well-known routes and difficulties with new ones. Moreover, many people simply afraid of being helpless in constant movement of people, vehicle and other road users. It is therefore advisable to offer new solutions of the problems with existing technologies. This paper proposes the design and develops a portable stick for a blind people/impaired people for convenient use and navigation in public and private places.

Visual debilitation also known as blindness is the condition which is affecting many individuals around globe. This leads to loss of vision. Blind individuals must recognize objects. So, these people require some aiding equipment. Almost all blinds cannot walk around independently and require dependent on someone to travel. The preferred walking aid for blind is the traditional white cane.

White cane is one such tool which are used by blind or who have imperfect vision to be independent. The cane helps blind to find obstacles and to overcome them safely. It was recognized as the standard gear for the visually impaired. Therefore, various technologies are used as solution to assist the blind people. Some researchers have developed walking stick for visually impaired people for safe navigation. In work [1], walking stick consists of a camera, earphone for output and four ultrasonic sensors. This system gives the result for all 360 degree from the position of the cane. The camera is used for text and object recognition. In [2], authors have developed walking stick with an ultrasonic sensor for detecting obstructions using various buzzer sound for each type of obstruction. This system includes wireless RF remote control which alARDUINO buzzer uniquely when pressed and also for locating the blind stick when it is misplaced.

OVER VIEW:

However a more astonishing fact is that out of these 285 million people, 39 million people are completely blind. It is not a herculean task to comprehend the amount of hardship which is inflicted upon these innocent souls. Even, many children are blind since birth and we must remember the fact that these children have a very long life ahead of them. Their lives can be improved significantly if their dependence is reduced to a considerable extent. This played an essential role in our decision to come up with the very notion of an advanced blind stick. Owing to amount of strain which is being subjected to our eyes, the probability in enhancement of number of blind people are bound to rise. The purpose of this blind stick would be to make blind people more independent [2]. In fact, it will give positive dimensions to their life. The traditional obstacle detection methods are obsolete and

need considerable modifications. In this paper, we were expected to tackle a real world problem. In a nutshell, we aimed at providing a technical solution to a real world problem which would help society in some form or the other. The purpose of this project would be to identify ways and means to make the lives of blind people much easier. To be specific, this project will help blind people identify obstacles and make their next movement according to presence or absence of obstacle. At the same time, we realize there may be circumstances wherein the blind person may be bewildered about his next movement. Authors have introduced system which includes crutch and bracelet. So that crutch will detect obstacles in front of them with sensors. The other invention [4] by authors is smart cane which can detect all obstacles in range of 4m during 39ms and output is through audio-based frequency clips for announcing obstacles detection. In [5], the authors have developed portable device for blind peoples that will provide direction to new locations and alert them about obstacles in their path during outdoor navigation. Using a ST microelectronic, this system has MEMS digital compass module which will allow to give more accurate direction for the blind person. We have proposed a system for blind people to navigate in safe path by alerting presence of obstacles.

2. RELATED STUDY:

A. Advanced Electronics Based Smart Mobility Aid for the Visually Impaired Soceity

The realm of electronics is growing rapidly. Advanced electronics are employable in assisting the visually impaired society in various ways. According to World Health Organization (WHO) approximately 285 million people are blind. Major researches have been under consideration on developing a smart stick for seeking a smoother routine

life and welfare towards the blind society. This paper proposes and analyses a brand new thought in eliminating the stick and mount these sensors on the visually handicapped person body itself [4]. B. Real-time Dangling Objects Sensing: A Preliminary Design of Mobile Headset Ancillary Device for Visual Impaired This analysis planned a mobile Real-time Dangling Objects Sensing (RDOS) prototype, which found on the cap to sense any front barrier. This device utilizes low cost un-hear able sensing element to act as another complement eye for blinds to know the front hanging objects. The RDOS device will dynamically regulate the sensor's front angle that's trusted the user's body height and promote the sensing accuracy. Two major needed algorithms to measure the height-angle activity and un-hearable sensing element alignment and planned unit area. The analysis team additionally integrated the RDOS device with mobile automation devices by human action and Bluetooth to record the walking route [3].

C. Assistive Infrared Sensor Based Smart Stick for Blind people In this paper authors tend to propose a smart stick with lightweight weight, low cost, user friendly, quick response and low power consumption and stick supported by infrared technology. A combination of infrared sensors will observe stair-cases and different obstacles presence within the user path. The experimental results gives good accuracy and therefore the stick is ready to observe all of obstacles [2]. D. Design and Implementation of Mobility Aid for Blind People. The proposed system is a jacket which will have sensors mounted on it. There will be five sensors mounted on the jacket. One sensor detects potholes or stairs. The other obstacle near head. The three sensors are used to detect obstacles in front, right and left direction. The user is notified about

the obstacle through specific voice commands which are stored in a Micro SD card. These instructions are played by the microcontroller and are heard by the user through the headphones [1].

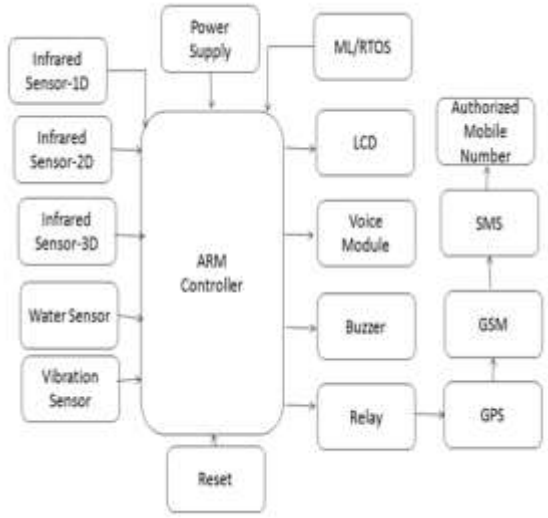

Fig.2.1. Proposed model.

3. PROPOSED SYSTEM:

There are number of blind people in the society, who are suffering while exercising the basic things of daily life and that could put lives at risk while travelling. There is a necessity these days to provide security and safety to blind people. There have been few devices designed so far to help the blind. Blindness or visual impairment is a condition that affects many people around the world. The usage of the blind navigation system is very less and is not efficient. The blind traveler is dependent on other guide like white cane, information given by the people, trained dogs etc. Many virtually impaired people use walking sticks or guide dogs to move from place to place. A guide dog is trained for guiding its users to avoid the accidents from objects and barriers over a fixed path or in a fixed area. When a visually impaired person uses a walking stick, he waves his stick and finds the obstacle by striking the obstacles in his way.

The study of previously developed systems and analysis of the implementation methods used, led us to define a new system which could overcome the disadvantages in the previous systems. Therefore using the existing technologies we provide a

solution to the stated problem. The device has proximity infrared sensors which provide the vibration alert to avoid the obstacles..The whole device is designed to be small and is used in conjunction with the white cane. This device is connected to an android phone through Bluetooth. An android application is designed which gives voice navigation based on GPS tags read and also updates person's location information on the server. Also, vibration alerts are provided through the smart phone on obstacle detection. One more application is designed for family members to access the blind person's location through the server, whenever needed.

The visually impaired have to face many challenges in their daily life. The problem gets worse when they travel to an unfamiliar location. Only few of the navigation systems available for visually impaired people can provide dynamic navigation through speech output. None of these systems work perfectly for both indoor and outdoor applications. In this paper, we propose a navigation device for the visually impaired which is focused on providing voice output for obstacle prevention and navigation using infrared sensors, Wireless technology, and android devices. The proposed device is used for guiding individuals who are partially sighted or blind.

4. OPERATION WITH RESULTS

The proposed device is focuses on the visually impaired people who cannot walk independently in unfamiliar environment. The main aim of our system is to help the blind people to move independently in the unfamiliar environment.Fig.3 shows the architecture of the proposed system. The system has four main modules: A. PCB unit, GPS, GSM and Wireless sensors. The first is PCB unit, which consists of ARDUINO microcontroller, MAX232 and IR sensors. Along with these

components, there will also be an Water Level sensor and Vibration Sensors. ARDUINO Microcontroller is used to control the various elements on the PCB unit. 3 IR sensors are used for 3- Dimensional obstacle detection.

RESULTS:

The idea of the proposed system came into existence because of a short visit to a blind school. It was seen that the individuals were given training to walk with a stick along a fixed path every day with a person to guide each of them. The inception of the project was marked by the conversations held with the blind people in the school and their staff. The data collected was indicative of the facts and miseries of their daily life. The visual disability made them incapable of doing any kind of simple chores independently. This laid us to research on the already existing technologies and conduct literature survey.

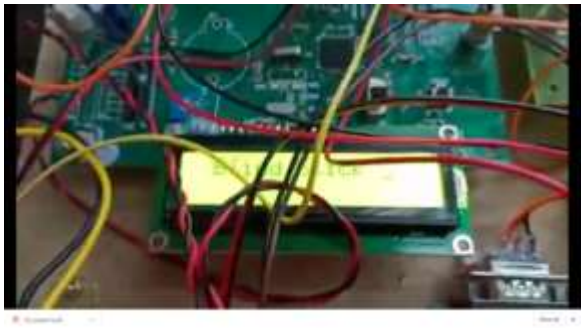

Fig.4.2. Hardware Kit Implementation.

Location formation using GPS and GSM module

When a blind or elderly person is out of home for walk or for other reason, if his/her health becomes suddenly poor i.e. if he feels that it is difficult for him to reach home back, he can intimate one of his relatives about this. There is an alert button provided on the stick, this button when pressed sends the coordinate of stick to a pre stored mobile number, i.e. "+91**********" via GSM module through SMS. The GPS module calculates the latitude and longitude of the location of the user.

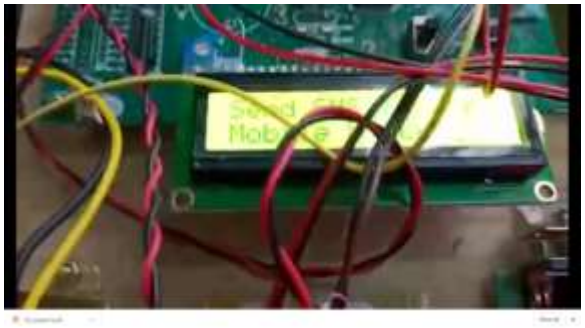

Fig.4.2. Mobile number registration

Fig.4.2.Vibration sensor indication.

Fig.4.2. 3D IR sensor.

Fig.4.3.Speaker output image.

Significance of the System

The main advantage of the system is that it helps the blind people in both indoor and outdoor, care-free navigation. The devices placed in the stick makes it comfortable and easy to handle. The smart stick helps in detecting obstacles placed at a distance in front of the user. The system is suitable for both indoor and outdoor environment. The information regarding obstacles is given through voice alerts, eliminates the difficulty of understanding vibration patterns which was used in earlier systems. The system is a moderate budget mobile navigational aid for the visually impaired.

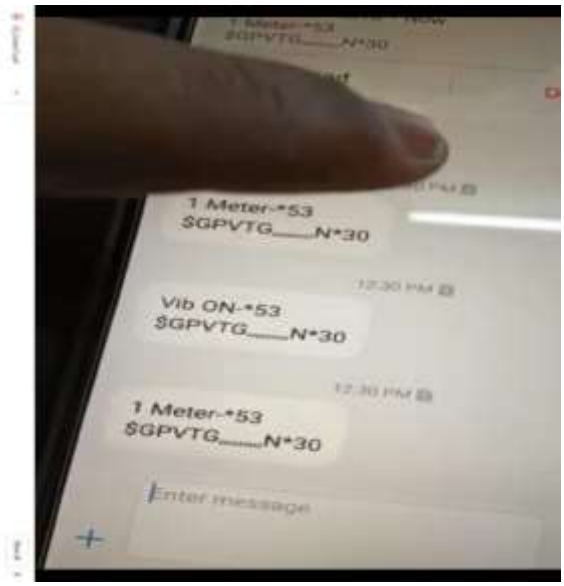

Fig.4.4. Output results at vibration detected time.

Fig.4.5.1st IR sensor detected time we get 1 meter distance detected.

5. CONCLUSION:

The proposed system tries to eliminate the flaws in the previous system. It aims to solve the problems faced by the blind people in their daily life. The system also takes measures to ensure their safety. The project intended the blueprint and architecture of a smarter concept of DEEP LEARNING 3D INTELLIGENT WALKING STICK for blind and disable people. This blind aid system can be rendered a fresh dimension of useful assistance and gives a sense of artificial vision along with dedicated obstacle and hollow detection circuitry. This cost effective and light weight device can be designed to take of pattern of a clastic and portable device, which can be unconditionally mounted on an ordinary white cane or blind stick. The aimed combination of several working sub-systems makes a time demanding system that monitors the environmental scenario of static and dynamic objects and provides necessary feedback forming navigation more precise, safe and secure. It can be further enhanced by using VLSI technology to design the PCB unit. This makes the system further more compact. Also, use of active RFID tags will transmit the

location information automatically to the PCB unit, when the intelligent stick is in its range.

REFERENCES:

[1]. M. Vanitha, A. Rajiv, K. Elangovan, S. Vinoth Kumar, "A smart walking stick for visually impaired using Raspberry pi", Sriram Engineering College, International journal of pure and applied mathematics, volume 119 no. 16 2018,3485-3489, 2018.

[2]. Rashidah Funke Olanrewaju, Muhammad Luqman Azzaki Mohd Radzi, Mariam Rehab, "iWalk: intelligent walking stick for visually impaired subjects", Proc. of the 4th IEEE International conference on smart instrumentation measurement and applications (ICSIMA) Putrajaya, Malaysia, 28-30 November 2017.

[3]. Yi-Qing Liu, Zhi-Kai Gao, Zhang-Jian Shao, Gu-Yang Liu "Intelligent ultrasonic detection of walking sticks for the blind", ECAI 2017- International Conference -9 th Edition, electronics, computers and artificial Intelligence, Targoviste, ROMANIA, 29 June -01 July, 2017.

[4]. Ayat Nada, Ahmed Farag Seddik, Mahmoud Fakhr, "Effective fast response smart stick for blind people", conference paper – April 2015.

[5]. Chris Urquhart, Nathaniel Sims, "Blind assist", department of electrical and computer engineering, Howard university, April 25, 2012.

[6]. S. Munirathnam – professor, S. Amrutha Valli-UG Scholar "Assistive voice alert based smart stick for blind people with GPS", International journal of engineering trends and applications (IJETA)-volume 5 issue 2, Nellore, India, Mar-April 2018.

[7]. Department of Computer Techniques engineering, Al- Kafeel University College, Kufa 31003, Province of Najaf, Republic of Iraq; received:14 Jan 2018; accepted: 8 march 2018; published:13 March 2018.

[8]. Bor-Shing Lin, Cheng-Che Lee, Pei-Ying Chiang., "Simple smartphone – based guiding system

for visually impaired people", Article, National Taipei University, Taipei, Taiwan, academic editor: Antonio Jimenez. Received:23 April 2017; accepted:9 June 2017; published:13 June 2017.

[9]. Mr. Praveen Olekar, "Integrated smart shoe for blind people", SIET, Tumakuru, project reference no.:39S_BE_0939, 2015-2016.

[10]. Ashraf Anwar, Sultan Aljahdali, "A smart stick for assisting blind people" IOSR journal of computer engineering (IOSR-JCE) volume 19, issue 3, ver II (may-June, 2017), PP 86-90.

POWER QUALITY IMPROVEMENT BASED ON ARTIFICIAL NEUTRAL NETWORK CONTROLLER &DYNAMIC VOLTAGE RESTORER

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ABSTRACT:

Renewable energy sources, which are abundant in nature and climate friendly, are the only preferable choice of the world to provide green energy. The limitation of most renewable energy sources specifically wind and solar PV is their intermittent natures which are depend on wind speed and solar irradiance respectively and this leads to power fluctuations. To compensate and protect sensitive loads from being affected by the power distribution side fluctuations and faults, dynamic voltage restorer (DVR) is commonly used. This research work attempts to withstand and secure the effect of voltage fluctuation of grid connected hybrid PV-wind power system. To do so battery and super magnetic energy storage (SMES) based DVR is used as a compensating device in case of voltage sag condition. The compensation method used is a pre-sag compensation which locks the instantaneous real time three phase voltage magnitudes and angle in normal condition at the point of common coupling (PCC) and stores independently so that during a disturbance it used for compensation.

Keywords: SMES, Ultra capacitor, Battery energy storage system, high voltage, sag and swell.

1. INTRODUCTION:

Power top quality problems are split right into 2 groups' voltage high quality as well as regularity top quality. Voltage top quality problems are associated with voltage droop, voltage swell, under voltage as well as over voltage while regularity top quality concerns are connected with harmonics and also transients. Among one of the most important power top quality problems is voltage droop which is take place as a result of its use of voltage delicate tools. It has actually made industrials refines much more vulnerable to provide voltage droops [1] The DVR gadget includes 5 major areas; (i) Energy Storage Unit: It is in charge of power storage space in DC kind. Flywheels, lead acid batteries, Superconducting Magnetic Energy Storage (SMES) as well as Super-Capacitors could be utilized as power storage space gadgets, the quotes of the regular power effectiveness of 4 power storage space innovation. Electric power storage space gadgets come under indirect power storage space classifications. The kept power is reconverted back to electric power, when a supply of electric power is needed, it is hard to shop as well as reconvert huge quantity of power. Numerous power storage space gadgets are currently utilized for voltage droop payment in the DVR system. Electric power storage space gadgets are extremely capacitor, superconducting magnetic power storage space (SMES) and so on. Dynamic voltage repair (DVR) is an approach of conquering voltage droops that happen in electric power circulation. These are an issue since spikes eat power as well as droops minimize effectiveness of some tools. DVR conserves power with voltage shots that could impact the stage as well as wave-shape of the power being provided. Instruments for DVR consist of fixed var gadgets, which are collection payment gadgets that make

use of voltage resource converters (VSC).

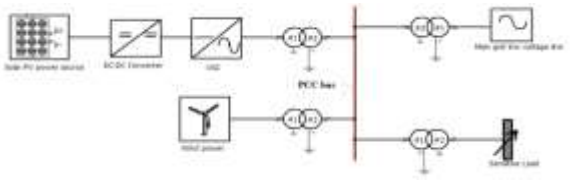

Fig.1.1. Model diagram.

2. PREVIOUS STUDY:

Supply voltage could be secured by faucet transforming transformers, uninterruptable power materials (UPS), shunt attached compensators, or vibrant voltage conservator (DVR) systems. Faucet transforming transformers have actually been revealed to deal with a slow-moving feedback time and also could just outcome distinct voltage degrees. UPS systems give the full voltage waveform throughout a power failing as well as could verify expensive as well as unneeded in case of partial voltage droops. A DVR is a collection attached tool with the ability of voltage settlement with quick reaction time by infusing a voltage in collection with the supply. DVR systems could be independent using power from the Grid to alleviate disruptions. Conversely, DVR systems could make use of power storage space to give power throughout settlement such as capacitors for temporary storage space or batteries for longer-term storage space. The fundamental concept of the vibrant voltage conservator is to infuse a voltage of called for size as well as regularity, to ensure that it could bring back the lots side voltage to the preferred amplitude as well as waveform also when the resource voltage is out of balance or altered. Typically, it utilizes a gateway shut off thyristor (GTO) strong state power digital buttons in a pulse size regulated (PWM) inverter framework.

3. PROPOSED SYSTEM:

This job takes a look at making use of superconducting magnetic and also battery crossbreed power storage space to make up grid voltage

Fluctuations. The superconducting magnetic power storage space system (SMES) has actually been mimicked by a high-current inductor to explore a system using both SMES and also battery power storage space experimentally. The style of the lab model is defined carefully, which includes a series-connected 3 stage voltage resource inverter made use of to control air conditioner voltage, as well as 2 bidirectional dc/dc converters utilized to regulate power storage space system fee and also Discharge. "DC bus degree signalling" and also "voltage droop control" have actually been utilized to immediately regulate power from the magnetic power storage space system throughout short-duration, high-power voltage droops, while the battery is utilized to give power throughout longer term, low-power under voltages. Power storage space system hybridization is revealed to be useful by minimizing battery top power need compared to a battery-only system, and also by boosting lasting voltage assistance capacity compared to an SMES-only system. Subsequently, the SMES/battery crossbreed vibrant voltage conservator could sustain both temporary high-power voltage droops and also lasting under voltages with substantially lowered superconducting product expense compared to an SMES-based system.

4. SIMULATION RESULTS:

As it is shown in Fig. 5 and Fig. 7, by observing the voltage level at the PCC and SOC of the SMES, the SMES will charge, discharge or stayed with energy storing states. To charge the SMES, both switches Sw1 and Sw2 should be turned on and to discharge both Sw1 and Sw2 should be turned off. In the energy storing state, Sw1 will be turned off and Sw2 will be turned on. The reference energy compares with the stored energy in the SMES, supply it to PI_11 and by multiplying with ONOFF value it will be transferred through the

differentiator to produce the power. After that, the power from SMES will be compared with the DC power (Pdc) from the DC-link capacitor and multiply with ON-OFF value so that finally transferred to PI_12 to generate the reference signal. Like the BES, the SMES will charge and discharge if its' SOC is below 100% and above 5% respectively. The SOC of the SMES is measured by comparing its actual energy stored with its maximum energy capacity. When the SOC is in between 5% and 100%, and if voltage swell or sag happens at the PCC, the SMES will be on charging or discharging state respectively. Otherwise, if the voltage level at the PCC is normal or it is at swell condition, but SOC of the SMES is 100%, or it is in sag condition, but SOC of the SMES is 5% then the SMES will be at energy storing state. Based on the status of the BES and SMES devices, the overall BES-SMES based DVR will operate in these three states.

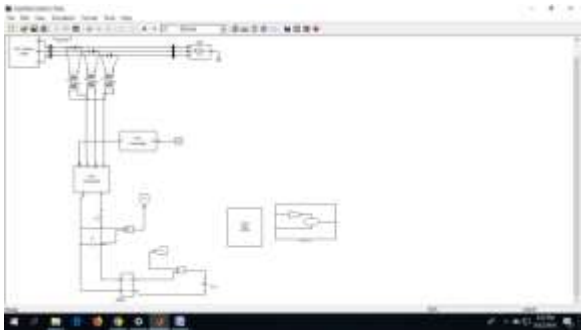

Fig.4.1. Simulation circuit.

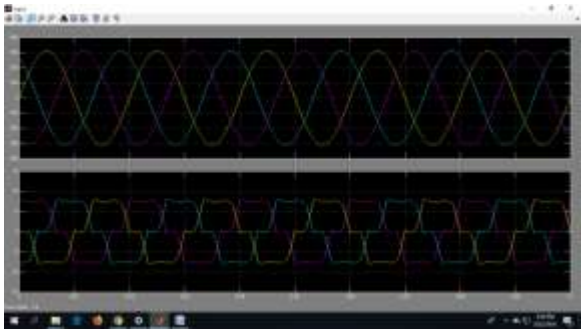

Fig.4.2. Grid side voltage and current.

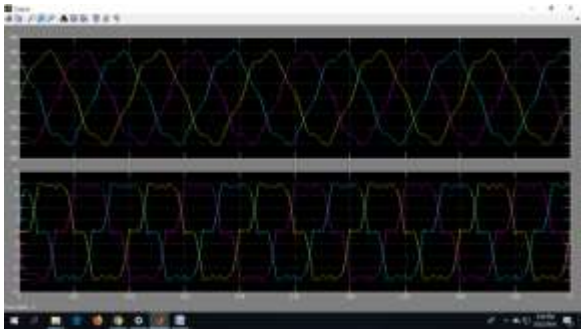

Fig.4.3. Load side voltage and currents.

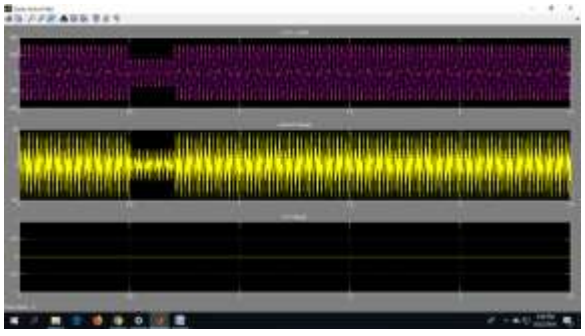

Fig.4.3. Voltage disturbances.

5. CONCLUSION:

The efficiency and unique crossbreed DVR system geography has actually been evaluated experimentally as well as revealed to properly supply voltage payment for temporary droops as well as long-lasting under-voltages. A model system has actually been established which shows an efficient technique of interfacing SMES and also battery power storage space systems to sustain a 3 stage lots. The system has actually been revealed to autonomously prioritise using the temporary power storage space system to sustain the tons throughout deep, temporary voltage droops and also a battery for reduced deepness, lasting under-voltages. This could have advantages in regards to enhanced voltage assistance ability and also decreased expenses compared to a SMES-based system. Fringe benefits consist of lowered battery power ranking demand and also an anticipated renovation in battery life compared to a battery-only system because of decreased battery power biking as well as optimal discharge power

REFERENCES

[1] P.K. Ray, S.R. Mohanty, N. Kishor, as well as J.P.S. Catalao, "Optimal Feature as well as Decision Tree-Based Classification of Power Quality Disturbances in Distributed Generation Systems," Sustainable Energy, IEEE Trans., vol. 5, Sept. 2014, pp. 200-208.

[2] D. Novosel, G. Bartok, G. Henneberg, P. Mysore, D. Tziouvaras, and also S. Ward, "IEEE PSRC Report on Performance of Relaying During Wide-Area Stressed Conditions," Power Delivery, IEEE Trans., vol. 25, Jan. 2010, pp. 3-16.

[3] "IEEE Recommended Practice for Monitoring Electric Power Quality," in IEEE Std 1159-1995, ed. New York City, NY: IEEE Standards Board, 1995, p. i.

[4] S. Jothibasu as well as M.K. Mishra, "A Control Scheme for Storageless DVR Based on Characterization of Voltage Sags," Power Delivery, IEEE Trans., vol. 29, July 2014, pp. 2261-2269

[5] B. Otomega and also T. Van Cutsem, "Undervoltage Load Shedding Using Distributed Controllers," Power Systems, IEEE Trans., vol. 22, Nov. 2007, pp. 1898-1907.

[6] L. Chun, J. Savulak, and also R. Reinmuller, "Unintentional Islanding of Distributed Generation: Operating Experiences From Naturally Occurred Events," Power Delivery, IEEE Trans., vol. 29, Jan. 2014, pp. 269-274.

[7] S. Tohidi, H. Oraee, M.R. Zolghadri, S. Shiyi, as well as P. Tavner, "Analysis as well as Enhancement of Low-Voltage Ride-Through Capability of Brushless Doubly Fed Induction Generator," Industrial Electronics, IEEE Trans., vol. 60, March 2013, pp. 1146-1155.

[8] R. Lawrence, "Voltage optimization," Industry Apps. Mag., IEEE, vol. 12, Sept. 2006, pp. 28-33.

[9] P. Kanjiya, B. Singh, A. Chandra, as well as K. Al-Haddad, ""SRF Theory Revisited" to Control Self-Supported Dynamic Voltage Restorer (DVR) for Unbalanced as well as Nonlinear Loads," Industry Applications, IEEE Trans., vol. 49, May 2013, pp. 2330-2340.

REAL TIME WIRE LESS EMBEDDED ELECTRONIC FOR SOLDIER SECURITY

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ABSTRACT:

Security of data in army stations is very important issue. In early systems, at the time of information transmission between two army stations, it can be hacked by terrorists, spies and enemies. Communication plays vital role in day to day life .There are two types of communication such as wired and wireless. Basically wireless communication is mostly preferred over wired .But sometimes we need a secured wireless communication in case of industries, companies etc. Data security is very important especially from defence point of view. There are various techniques for transmission of data securely. In military area secure communication is required. The messages send or received should not be hacked. For this controller base wireless communication system is used for secure message transmission. In this we used half duplex encrypted system so messages in this system cannot be hacked. For security special trans-receiver is used namely HC-12 which uses special AT commands for providing security. The messages can be sending from any module and there is the choice that the message is either broadcast or can send to specific module.

Keywords: GSM, GPS, Switch, Buzzer.

1. INTRODUCTION:

Everyone in this world wants to be safe and secure. When it comes to the safety and security of Multinational companies, Military, Army, the situation becomes more complicated. Even a common man puts his maximum efforts to protect his data. The popular methods to protect the data in a secure way is to encrypt the data while sending and receiving , decrypt the data to retrieve the original message. Before transmitting the data, the data will be converted into an unreadable form and will be sent. At receiver side the opposite operation of encryption is carried out

to recover back the original message. Thus the data will be protected in every way by following the encryption and decryption standard formats. Wireless makes this project more flexible. Some of the software's are needed to be installed into the system before using them and hardwired connections. The hardware connections and cabling can be completely eliminated in this project. In the Military area secure communication is required. The information shared between them is very confidential. The message send or receive should not hacked. For the secure communication system a controller based wireless communication system is used for secure message and data transmission and reception. There are two types of communication-Half duplex and full duplex. This project is based on secure/Encrypted half duplex system. The messages in this system cannot be hacked. In communication systems transmission of data from one place to another place is important. These helps in monitoring wide control systems as well as the management network. In top level managements some information and decisions are secret. Also, the secret data from one place to another should be sent without any interruptions. The country to county communication, the communication between the prime minister and the defense minister requires to be kept very secret. Various types of communication means are used for achieving this purpose. Some people use encryption and decryption methods i.e. some erratic data is added at the transmitter end and the mix signal is transmitted. At the receiver end the added signal is removed in order to get the original signal transmitter. If the signal is tapped and tried to decode it is not possible due to encryption. And thus, the protection against such a risk is provided. But this are the old methods used in previous types. Now a days, the decoding / encoding phenomenon's are done as in previous one but the communication media is modernized. The wireless communication is preferred. RF modules with digital communication are very accurate and reliable for wireless communication. These modules have the range up to 1.5 km and the obstacles don't cause any communication failure this way these modules are popular. Microcontroller is used for encoding/decoding purpose. Our project is encoding and decoding techniques for data transmission. These use the PIC microcontroller at both sides and make it feasible to send the data from one place to another place. It is beneficial and cost effective as far as the application importance is considered.

2. LITERATURE SURVEY

1) The role of communication in day to day life is very important .Communication can be of two types which are wireless or wired. Basically wireless communication is mostly preferred over wired .But sometimes we need a secured wireless

communication in case of industries, companies etc. This paper helps in enabling the user for transmitting data wirelessly through ZigBee with encrypting data to provide security. In the paper it consists of two sections they are transmitter and receiver .The data can be sent to microcontroller through pc by using software called hyper terminal, this software is used for serial communication. The microcontroller after receiving the data it forwards the data to the ZigBee transmitter which is connected to the microcontroller. The data is encrypted and then transmitted to receiver. ZigBee transceiver does data transmission. Encryption does conversion of plain text to cipher text. Original data is Plain text whereas the modified data by using operations so that only authorized person can decode is called as Cipher text. Decryption does conversion of Cipher text to Plain text. The received data is decrypted and is displayed on pc which requires some password to open the data. So by this the data cannot be hacked and is secured.[1]

2) Security of data in army stations is an important issue. In early systems, at the time of information transmission between two army stations, it can be hacked by terrorists, spies and enemies. Cryptography is a very important system employed for this purpose. There are various types of algorithms available for encryption and decryption of data and new algorithms are evolving. Polyalphabetic substitution cipher is a strong algorithm used for security of data in army stations. In this paper, various techniques of security of data and one the algorithm using polyalphabetic substitution cipher are discussed.[2]

3) In earlier security systems, data transmission between two army stations was being hacked by terrorists, enemy nations and even spies. Hence, data security is very important especially from defense point of view. There are various techniques for transmission of data securely. Cryptography is a one of the technique which can be used for secured transmission of data. There are numerous algorithms available for encrypting and decrypting data and many algorithms are being discovered. Poly alphabetic cipher algorithm is one of the strongest algorithms used for securing data in army stations. In this paper, poly alphabetic cipher algorithm is discussed for wireless data transmission between army stations using arm7 processor.[5]

4) Stealthiness can be described as a disposition to be sly and to do things surreptitiously. This paper presents a new architecture for flexible and secure networking in battlefields that enables stealthy and covert communication in the presence of node mobility. Our architecture is based on the combination of optical (fiber) and

wireless links. Our objective is to be able to carry on undeterred communication without the attack/eavesdropping nodes being able to detect the presence of any communication. This objective is not only crucial for successful completion of the operation, but also for the safety of our mobile nodes, by not giving out their locations. We combine the advantages of optical links, such as high bandwidth, low delays, low error rates, good security, with the advantages of wireless links, such as mobility and flexibility, along with directional antennas for communication. From security point of view, we also assume presence of red zones, which are the ones controlled by the adversary or where the adversary can trace wireless activities.[6]

3. METHODOLOGY

Existing system:

In Existing system in enabling the user for transmitting data wirelessly through ZigBee with encrypting data to provide security. In the paper it consists of two sections they are transmitter and receiver .The data can be sent to microcontroller through pc by using software called hyper terminal, this software is used for serial communication. The microcontroller after receiving the data it forwards the data to the ZigBee transmitter which is connected to the microcontroller. The data is encrypted and then transmitted to receiver. ZigBee transceiver does data transmission. Encryption does conversion of plain text to cipher text. Original data is Plain text whereas the modified data by using operations so that only authorized person can decode is called as Cipher text. Decryption does conversion of Cipher text to Plain text. The received data is decrypted and is displayed on pc which requires some password to open the data. So by this the data cannot be hacked and is secured

PROPOSED SYSTEM:

To design a soldier tracking system using wireless system for monitoring the parameters of soldier are as Body temperature & Temperature. Biomedical sensors: Here to find the health status of soldier we are using a body temp sensor to measure body temperature as well as pulse rate sensor. These parameters are then signal conditioned and will be stored in the memory. One of the fundamental challenges in military

operations lays in that the Soldier not able to communicate with control room administrator. In addition, each organization needs to enforce certain administrative and operational work when they interact over the network owned and operated by other organizations. Thus, without careful planning and coordination, one troop cannot communicate with the troops or leverage the communication infrastructure operated by the country troops in the same region. The purpose of this investigation was to test the components of the Soldier Tracking and Performance Measurement System against the statement of requirements as found in the Request for Proposal. Secondary aims of this investigation included gathering data that will allow potential users of the system to understand its capabilities and limitations, as well as allow efficient planning of both time and resources necessary to ensure efficient and productive use of the system for training the solider.

A robust accurate positioning system with seamless indoor and outdoor coverage is highly tool for increasing safety in emergency response and military operation. GPS-based positioning methods mainly used to field rescue. The position and orientation of the rescuer and the trapped is acquired using GPS chip. Using the GPS data of both the units the relative distance, height and orientation between them are calculated from the geometric relationships based on a series of formulas in Geographic Information Science (GIS). Using this technology, we are doing the navigation between two soldier .the data will be send wirelesslyby RF Transceiver. This device can do accurate coordination via wireless communication, helping soldier for situational awareness. GPS module have serial interface. Receiverinformation are broadcast via this interface in a special data format. This format standardized by the National Marine Electronics Association (NMEA) .

PHYSIOLOGICAL SIGNALS AND BIOSENSORS
With recent advances in technology, various wearable sensors have been developed for the monitoring of

human physiological parameters. The various sensing technologies are available, which can be integrated as a part of health monitoring system, along with their corresponding measured physiological signal. The measurement of these vital biosignal and their subsequent processing for feature extraction, lead to collection of real time gatheredparameter which can give an overall estimation of health condition at any real time There are a number of medical parameters of soldier that can be monitored, like ECG, EEG, Brain Mapping, etc. But these require complex circuitry and advanced medicalfacilities and hence they cannot be carried around by the soldier. The entire system would become bulky for the soldier.

Results explanation:

The system detects accident from vehicle and send message through GSM module. The message is received by another GSM module. Google Map Module It displays Google map show u exact location of accident and it details. It gets detail SMS from accident location. Hence there is small variation in the coordinates, initial value of latitude and longitude are same but fractional value changes with small difference.

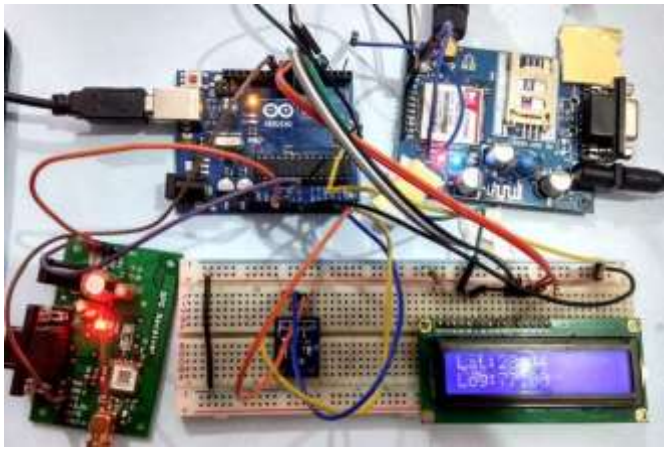

Fig.1. Hardware kit image.

Fig.2. Output results with location.

CONCLUSION

From the above implementation we came to the following conclusion: Security and safety for soldiers: Using GPS we can tracks position of soldier anywhere on globe and also the health parameters which provide security and safety for soldiers. Effective Communication is Possible: Soldiers can communicate anywhere using RF, DS-SS, FH-SS which can help soldier to

communicate among their squad members whenever in need and emergency. Less complex circuit and less power consumption. Since ARM processor require less power to operate So power consumption is less. Also the modules used are small in size, so complexity is also reduced.7

Future Scope:

We are finding the shortest path based on the distance of nearby hospitals but there may be chance that the traffic will be more in that path. So we need to come up with some algorithm which gets the nearby hospitals with minimal distance and traffic. We may add some modules which will also let the system know about the traffic details and then find out which node will take less time to reach from the accident spot. Another thing which we may add is 'first aid kit' for emergency medical treatment at the scene itself. We can also add some modules which will measure the injuries level or some additional information like blood group, heart beats, current glucose level which may be send to the hospitals in advance before the victims reaches the hospitals hence improvise the performance of the proposed system.

REFERANCES

[1] R. Ganiga, Rohit Maurya, Archana Nanade,"Accident detection system using Piezo Disk Sensor", International Journel of science, Engineering and Technology Research(IJSETR) volume6,Issue3,March 2017,ISSN 2278-7798.

[2].Hemjit Sawant, Jindong Tan, Qingyan Yang Qizhi Wang," Using Bluetooth and Sensor networks for intelligent transport systems", In proceeding of Intelligent Transport System; 2004

[3].Helia Mamdouhi, Sabira Khatun, Javed Zarrin," Bluetooth Wireless monitoring, Manging and Control for inter vehicle in vehicular adhoc networks", Journal of computer Science, Science Publication; 2009

[4].Jules White, Brian Dougherty, Adam Albright, Douglas C," Using Smartphone to Detect Car Accidents and Provide Situational awareness to emergency responders chirs Thompson", Mobile Wireless Middleware, Operating system and Application;2010

[5].Khyati Shah, Vile Parle, Swati Bairagi,Vile Parle "Accident Detection and Conveyor System using GSM and GPS Module" International journal of Computer Applications (0975-8887) .

[6].Pooja Shindalkar, Aasiya Fatema Shaikh, Chaitanya Mate, "Arduino Based Vehicle Accident Detection System", International journal of Innovative Research in Computer and

Communication Engineering (An 3297:2007 certified organization) Vol.5, Issue 4.

[7].E.Krishna Priya, P.Manju, V.Mythra, “IoT Based Vehicle Tracking and Accident Detection System” International journal of Innovative Research in Computer and Communication Engineering, (An ISO 3297:2007 Certified organization) Vol.5,Issue 3.

[8]. Tanushree Dalai, "Emergency Alert and Service for Automotives for India", International Journal of Advanced Trends in Computer Science and Engineering (IJATCSE) Mysore India, vol. 2, no. 5, pp. 08-12, 2013.

[9]. Manuel Fogue, Piedad Garrido, Francisco J. Martinez, JuanCarlos Cano, Carlos T. Calafate, and Pietro Manzoni (2012) “Assistance through Communication Technologies and Vehicle”, IEEE vehicular technology magazine.

[10]. PL Needham, Collision prevention: The role of an accident data recorder. Automated Emergency Call for Road Accident, European Commission Press G. Singh and H. Song, Using Hidden Markov Models in Vehicular crash detection, IEEE Transactions.

Real Time Speech Steganography for Secure Data Transmisson

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***Abstract*—Information hiding into a cover object is referred as steganography. Here the cover object might be an image, video, or speech. Speech steganography is a process of hiding message data into a cover speech without degrading the quality of cover speech. This article introduced a spread spectrum representation-based speech steganography using discrete wavelet transform (DWT), which decomposes the cover speech signal into approximated and detail coefficients i.e., low frequency and high frequency. Our proposed speech steganography provides enhanced imperceptibility since DWT reconstructs the decomposed information without degrading the quality of speech. Our proposed approach is an extended version of existing Fast fourier transform (FFT) based steganography, where there is a lack of imperceptibility. Simulation results proved that the proposed algorithm is superior to the conventional algorithms. Also performed good enough simulations with low bit error rate and excellent imperceptibility.**

Keywords—steganography; spread spectrum; speech steganography; fast fourier transform; wavelet analysis; decimated wavelet transform.

I. INTRODUCTION

Steganography referred to hiding information or any secret message behind a cover object which might be an image, speech or video. This avails the persons who are authorized recipients can only view the message sent from the source end [1]. To obtain an effective steganography, one must need the following:

- Cover object to hide the secure information.
- Secret information i.e., message.
- Embedding procedure to get a stego information [2].
- Extraction process to reconstruct secret message at recipient [3].

This has lots of applications in several fields like multimedia, military, navy and civil etc. In practice, most of the steganography systems were implemented for images and videos as well. There are very lesser number of research papers published under speech steganography since designing of speech steganography is quite challenging and difficult compared to image and video steganographic systems. Spread spectrum [4] plays a significant role in speech steganographic systems since the speech is a discrete signal information and need to be processed over channel to embed the secret message and later it must be reconstructed by extracting the accurate message with cover speech separately.

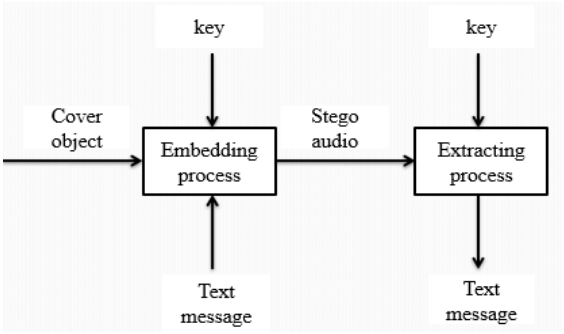


Fig.1 block diagram of digital steganography.

Figure 1 depicts the general steganography procedure which consists of cover object, secret message, secure key, embedding and extraction procedures. First, the secret message is embedded into a cover audio or speech with the help of key and using an embedding procedure. After embedding the message into a cover speech, stego speech is obtained. Then at the recipient end, the secret message will get extracted using the symmetric key and an extraction procedure which a reversible for embedding process. Author in [5] addressed least significant bit (LSB) approach for speech steganography, which embeds the message info into the speech data based on LSB approach. However, at the reconstruction end it was difficult to extract message data accurately. Similarly, there are several speech steganography systems were presented and published [6-10]. Recently, a spread spectrum-based speech steganography is implemented in [11], this approach utilized FFT for embedding the information into the speech signal. This provides enhanced performance over conventional speech steganographic systems. However, it was unable to extract the original embedded message due to the reconstruction issue of FFT algorithm and visibly the stego speech seems far distinct from the original speech signal, which shouldn't happen in practical applications.

Therefore, this article proposed wavelet-based speech steganographic system which is an extended version of FFT-based approach [11]. Due to the higher spectral efficiency of decimated wavelet decomposition, there will be a lossless reconstruction of cover speech and hidden message as well.

II. Existing Methodology

This section describes the existing FFT-based spread spectrum representation for speech steganographic system [11]. Primarily, the cover speech is transformed into frequency space using FFT, which computes the discrete fourier transform (DFT) of a speech signal with reduced number of computations. Next, the message info which is to be embedded into the frequency domain signal of a cover speech has converted into binary format by utilizing ASCII codes.

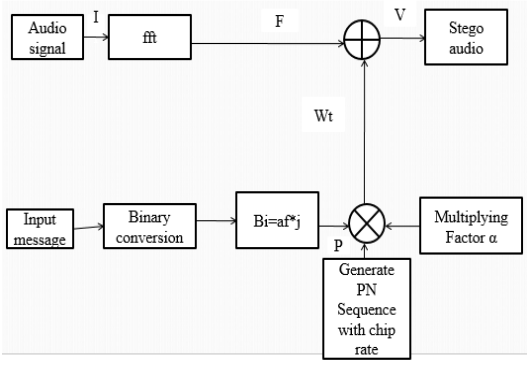


Fig. 2 Speech steganography using FFT approach [11].

Afterwards, this binary message info was spread over the channel using pseudo noise, chip rate as key and an embedding gain factor. Now, this obtained outcome was combined with the FFT signal to get the stego speech. Then, the reconstructed speech signal is obtained by computing inverse FFT to the stego speech. Finally, apply inverse to the embedding procedure to extract the hidden message from the stego speech.

III. PROPOSED METHODOLOGY

This section explains the proposed DWT based real time speech steganography for military applications, where there is a need for transmission of secret data from person/pc to pc/person with higher imperceptibility. This can be implemented in real time since the cover speech is directly recorded by the use voice as there is an option of speech record in every computer or laptop.

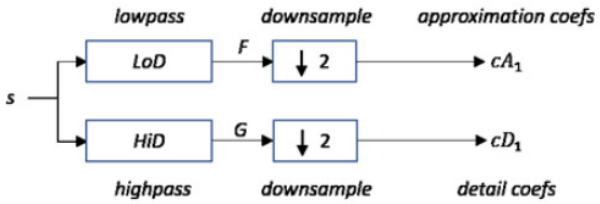


Fig. 3 Decomposition of signal using 1D-DWT.

A. DWT

This is an advanced transformation technique compared to fourier transform (FT), short time fourier transform (STFT). It has an adaptive nature of window selection, due to scaling property. As shown in Figure 3, 1D-DWT is applied to a speech signal to decompose the input speech signal into approximate and detail coefficients where the lower frequency subband is referred to approximate layer and higher frequency subband cited to detail layer. Practically, the approximate layer seems like original speech signal.

B. Algorithm

This section describes the proposed real time implementation of speech steganography, where the speech or speech is utilized as a cover object. In general, speech signals will be in .MP3 format most of the times. These MP3 speech signals have an information in byte sequences which later exchanged to bit sequence and subsequently represented in the range of -1 to 1 since spread spectrum methodology is utilized for steganography. Following formula shows the conversion of speech signal:

$$A = \{a_i | a_i \in \{-1,1\}\} \quad (1)$$

Now, FFT is used to transform the cover speech into frequency domain, which now has both real and complex information in it. After that, a pseudo noise (PN) sequence is generated in the range of 1 and -1 same as cover speech as given in equation (1). The generation of PN sequence is functioned via chip rate denoted with cr. If there are n number of signals, then there must be a generation of $cr \times n$ sequences. The generation of PN sequence P is as follows:

$$P = \{p_i | p_i \in \{-1,1\}\} \quad (2)$$

Now, utilize PN sequence form equation (2) and modulate every signal information by multiplying cr times, which then results in distributed signal of equation (1) and denoted with B as follows:

$$B = \{b_i | b_i = a_i, j \cdot cr \ \leq i < (j+i) \cdot cr\} \quad (3)$$

Afterwards, modulate both equation (2) and equation (3) with a multiplication factor α, which is referred as embedding strength factor. Later, it is included into the cover speech. For instance, w denotes the message included, cover speech referred as v and v' denotes stego speech i.e., where it consists both secret message and cover speech. Hence, it is formulated as:

$$w_i = \alpha \cdot \ b_i \cdot p_i \quad (4)$$

$$v'_i = \ v_i + w_i \quad (5)$$

This approach doesn't produce any kind of noise as existing algorithm [11], that generates higher noise when there is a large amplification and results in cover speech impairment. So, it is not necessary to be careful in choosing the strength factor and chip-rate as happened in [11]. The added signal will be a random signal due to

the PN sequence effect which has generated previously. There must be similar PN sequence generation of receiver to retrieve the information. Each cover object signal will be multiplied with the corresponding PN sequence, which can be shown as follows:

$$\sum_{i=j\cdot cr}^{(j+1)\cdot cr-1} p_i v_i' = \sum_{i=j\cdot cr}^{(j+1)\cdot cr-1} p_i v_i + \sum_{i=j\cdot cr}^{(j+1)\cdot cr-1} \alpha b_i p_i^2$$

If we look at the following terms:

$$\sum_{i=j\cdot cr}^{(j+1)\cdot cr-1} p_i v_i$$

For majority of samples, zero will be the value for these terms, which is due to the sequence of PN that causes addition of signal reaching 0 or a certain threshold value.

While the second term:

$$\sum_{i=j\cdot cr}^{(j+1)\cdot cr-1} \alpha b_i p_i^2$$

The above term has some noteworthy properties since the value of PN sequence is 1 or -1 which led the outcome of p_i^2 is 1.

Thus, the term can be simplified into:

$$\sum_{i=j\cdot cr}^{(j+1)\cdot cr-1} \alpha b_i$$

Since the value of bi is 1 or -1 which usually decides that when the value of term exceeds 0 then it is considered that the retrieved info is 1 and similarly when it is <0, retrieved info is 0. This is the reason for domain selection of B and P.It is clear that, earlier description concludes that for an accurate extraction of information which was embedded, the value of $\propto b_i$ must exceed a certain threshold value.

IV. Results and Discussion

This section describes the experimental analysis of proposed speech steganography with comparison to the FFT-based approach presented in [11]. All the simulations have been done in MATLAB 2018a environment. We tested the proposed and existing methods for various speech samples of different kind of persons like male, female, child and old age with a chip rate $cr = 400$. First, it will ask the user to speak anything for a period of 5sec (this can be varied according to user interest). Then user must enter the secret message (might be 8 to 10 characters) to be embedded into the cover speech as shown in Fig.4. Figure 5 discloses the secret message entered in input text box as shown in figure 4.

Performance of FFT-based speech steganography described in [11] shown in Figure 6, where the stego-speech lacks the imperceptibility as it is quite dissimilar to the cover speech that means there is a chance for unauthorized parties to identify something must be exists in stego-speech. In addition, bit error rate (BER) values also quite larger as shown in Table 1. Figure 7 demonstrates that performance of proposed real-time speech steganography, which disclosed the similarity between cover and stego speech and results in higher imperceptibility over existing FFT-based speech steganography.

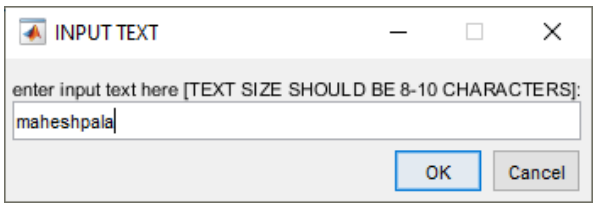


Fig. 4 Entering secret message to be embedded.

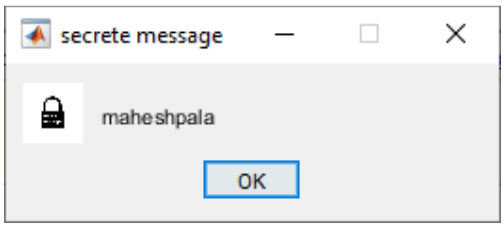


Fig. 5 Embedded message.

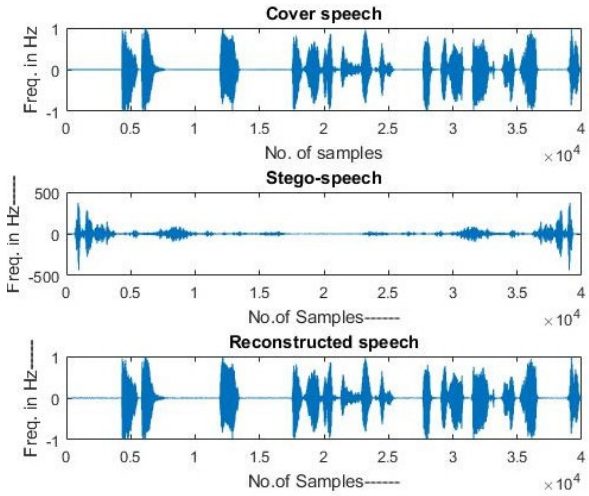


Fig. 6 Performance of FFT-based speech steganography [11].

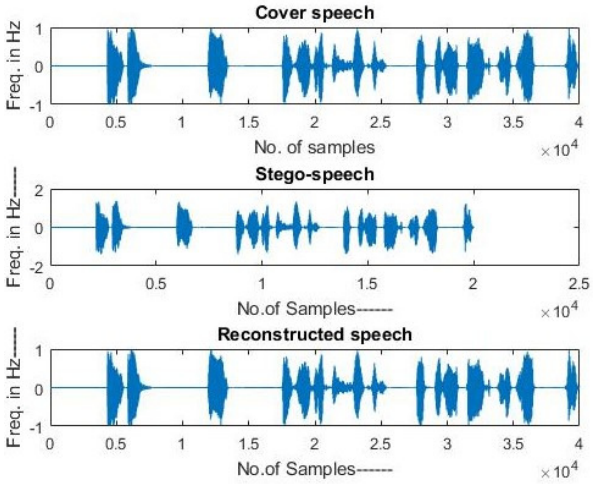


Fig. 7 Performance of proposed speech steganography.

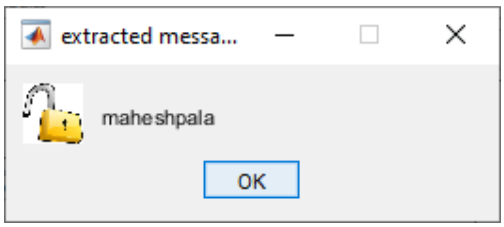


Fig. 8 Extracted message with proposed implementation.

Figure 8 displays the extracted secret message from stego-speech after separation of reconstructed speech from it. Figure 9 show the outcome of proposed speech steganography when there is a noise attack at in the stego-speech. Figure 10 describes the extracted messages from the noisy stego-audio where figure 10(a) show the extracted message using [11] and figure 10(b) show extracted message of proposed speech steganography. This concludes that proposed speech steganography lessens the BER when there is a noisy attack. In addition, it produced accurate message at the receiver end without degrading the perceptual quality of secret message.

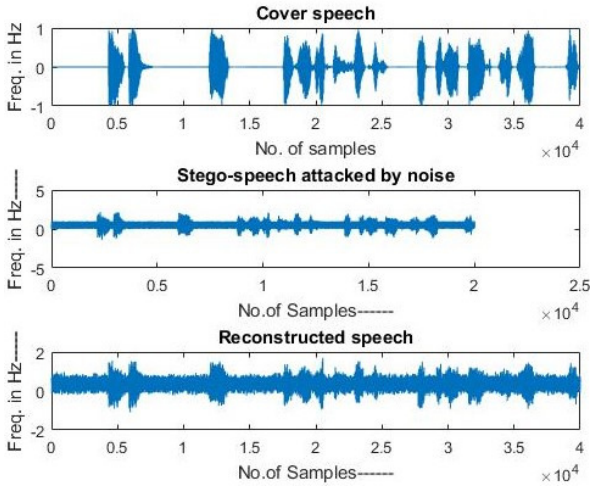
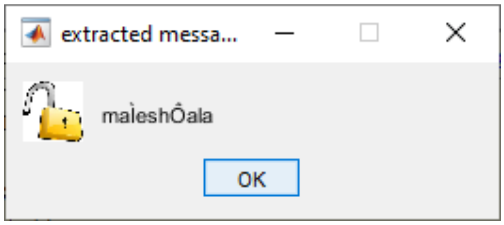


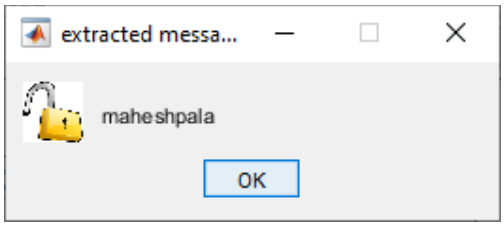
Fig. 9 Obtained results of proposed speech steganography with noise attack.

Table 1. Obtained BER values of existing and proposed speech steganography.

Parameter	FFT-based speech steganography [11]	Proposed speech steganography
BER without noise	0.00145	0.0000001
BER with noisy attack	4.25	0.000452



(a)



(b)

Fig. 10 Extracted message from noisy stego-speech. (a) FFT-based speech steganography. (b) proposed speech steganography.

V. CONCLUSIONS

This article addressed the implementation of spread spectrum representation-based speech steganography using DWT. Obtained simulations proven that the proposed speech steganography got superior performance over conventional FFT-based steganography algorithm. This method proved that it is very robust against any sort of noise attacks. It also reduced the computational complexity since it doesn't utilize any complex equations. Further, it is very easy and simple to implement in real-time.

REFERENCES

[1] S. Yang, Z. Song and J. H. Park, "High capacity CDMA Watermarking Scheme based on orthogonal Pseudo random subspace projection," International Conference on Multimedia and Ubiquitous Engineering, Jun. 2011.

[2] L. Fillatre, "Adaptive Steganalysis of Least Significant Bit Replacement in Grayscale Natural Images," IEEE Transactions on Signal Processing, vol. 60, no. 2, Feb. 2012.

[3] R. R. Ahirwal, D. C. Ahirwal and J. Jain, "A High Capacitive and Confidentiality based Image Steganography using Private Stego key," International coference on Information Science and applications, Feb. 2010.

[4] R. M. Naguraha, "Implementation of Direct sequence Spread Spectrum on Audio Data," International Conference on Informatics Engineering, Jun. 2011.

[5] S. Rekik, D. Guerchi,H. Hamam and S.-A. Selouani, "Audio Steganography Coding Using the Discrete Wavelet Transforms,"International Journal of Computer Science and Security, vol. 6, no. 1, 2012.

[6] A. Kaushal and V. Chaudary, "Secure image steganography using different transform domains," Int. J. Comp. App., vol. 77, no. 2, pp. 24-28, 2013.

[7] P. P. Balgurgi and S. K. Jagtap, "Audio steganography usde for secure data transmission," In Proc. of Int. Conf. Adv. Comp., vol. 174, Springer, New Delhi, pp. 699-706, 2013.

[8] S. Wang and M. Unoki, "Speech watermarking method based on for-mant tuning," IEICE Trans. Inf. Syst., vol. E98-D, no. 1, pp. 29–37, Jan. 2015.

[9] K. Bhowal et al., "A steganographic approach to hide infromation in audio signal using wavelet transform," Int. J. Adv. Comp. Sci., vol. 7, no. 4, pp. 42-47, 2016.

[10] V. V. Priyanka and Y. V. A. Sathyanarayana, "A New user interface for spreadspectrum representation based speech steganography using translation invariant wavelet transform," Int. J. Elec. Comp. Comm. Eng., vol. 4, no. 3, pp. 147-151, Jun. 2019.

[11] J. Chen and J. Carlos, "A Spread Spectrum Representation Based FFT Domain Speech Steganography Method," IEEE Transaction on Audio, Speech and Language letters, vol. 23, no. 1, 2015.

A MACHINE LEARNING FRAMEWORK FOR BIOMETRIC AUTHENTICATION USING ELECTROCARDIOGRAM

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ABSTRACT:

This paper introduces a framework for how to appropriately adopt and adjust machine learning (ML) techniques used to construct electrocardiogram (ECG)-based biometric authentication schemes. The proposed framework can help investigators and developers on ECG-based biometric authentication mechanisms define the boundaries of required datasets and get training data with good quality. To determine the boundaries of datasets, use case analysis is adopted. Based on various application scenarios on ECG-based authentication, three distinct use cases (or authentication categories) are developed. With more qualified training data given to corresponding machine learning schemes, the precision on ML-basedECG biometric authentication mechanisms are increased in consequence. The ECG time slicing technique with the R-peak anchoring is utilized in this framework to acquire ML training data with good quality. In theproposed framework four new measure metrics are introduced to evaluate the quality of the ML training and testing data. In addition, a Matlab toolbox, containing all proposed mechanisms, metrics, and sample data with demonstrations using various ML techniques, is developed and made publicly available for further investigation. For developing ML-based ECG biometric authentication, the proposed framework can guide researchers to prepare the proper ML setups and the ML training datasets along with three identified user case scenarios. For researchers adopting ML techniques to design new schemes in other research domains,the proposed framework is still useful for generating the ML-based training and testing datasets with goodquality and utilizing new measure metrics.

Keywords: HITS, Hash tags, CNN, ML.

1. INTRODUCTION:

Most application systems support Internet access for general users, identifying persons with their own body has become the trend for users to access application systems. In consequence, biometric authentication has become a hot research topic in recent years. Among various biometric authentication schemes such as fingerprint scanning and facial recognition, electrocardiogram authentication has the advantage of adopting live user body signals during authentication. In general, machine learning techniques are adopted to construct a verification model for user identification by getting user's live ECG data. Recently there are a number of state-of-art literatures on ECG based biometrics. However, several ECG biometrics challenges still require further investigation such as authentication categorization, pre-processing for data quality enhancement, data acquisitions, selection on Deep Learning (DL) and other Machine Learning classification approaches. This project introduces a ML framework for ECG based biometric authentication in order to mitigate identified challenges on ECG authentication. To better understand potential application environments for ECG authentication, it is necessary to identify basic application scenarios through use cases. In the proposed framework, application scenarios using ECG authentication are categorized into three general use cases: Hospital (HOS), Security Check (SCK) and Wearable Devices (WD). Furthermore, new data preprocessing techniques including the baseline adjustment of frequency artifacts in the ECG, the ECG data noise removal technique for Power Line Interference (PLI), and flipping mechanism for ECG signal due to the wrong placement of electrodes, are proposed. In addition, time slicing techniques are introduced in the framework to prepare ML-based training datasets along with new measure metrics developed for authentication precision evaluation. Four new measure metrics for data quality are introduced in the proposed framework. They are Mean Absolute Error Rate (MAER), Upper/Lower Range Control Limits (UCL/LCL), Accuracy Percentage within Ranges (APR), and Accuracy per UCL (APU).

2. LITERATURE SURVEY

In this session, we discuss about Biometric Authentication using Electrocardiogram by Machine learning Framework. Several ML techniques are adopted: Decision Tree (DT) and Support Vector Machine (SVM) for regression approach, and Artificial Neural Network (ANN) and Convolution Neural Network (CNN) for classification approach. Song-Kyoo (Amang) Kim received the M.S. degree in computer engineering from the Florida Institute of Technology, in 1999, and the Ph.D.

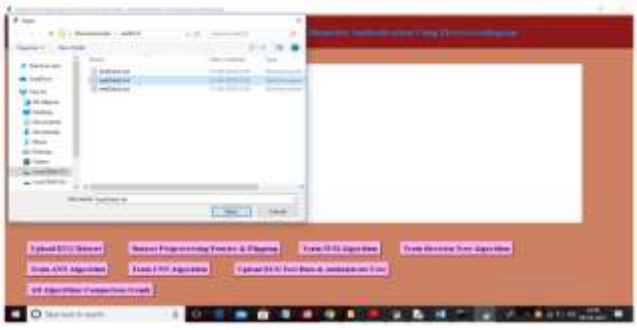
degree in operations research, in 2002. He is currently a Research Scholar with Khalifa University. He has been an Associate Professor of various universities in United Arab Emirates. Prior to joining in the Gulf regions, he was a Core Faculty Member of the Asian Institute of Management who taught Technology, Innovation, and Operations topics. Before joining the academy, he had been a Technical Manager with the Mobile Communication Division, Samsung Electronics, for over ten years and mainly dealt with technology management in IT industries. He has authored various research papers and patents focused on mobile industries. His research interests include artificial intelligent and ECG-based biometric securities. His current research interests include Block chain Governance Game. For developing ML-based ECG biometric authentication, the proposed framework can guide researchers to prepare the proper ML setups and the ML training datasets along with three identified user case scenarios. For researchers adopting ML techniques to design new schemes in other research domains, the proposed framework is still useful for generating the ML-based training and testing datasets with good quality and utilizing new measure metrics.

3. METHODOLOGY

Traditionally, a patient will take an ECG test to diagnose whether a heart disease or a heart stress is occurred. The equipment for gathering ECG signals from a patient is usually elaborated and complicated for gathering the high quality for medical diagnostics. Therefore, the sampling time for getting ECG data is relatively long (from couple of minutes to hours dependent on the type of ECG test) and multiple leads are used during an ECG test. A new use case for ECG test is to identify patients in a hospital (Category 1; HOS use case). The assumption is that those patients have to register their identities (i.e., their names or legal identity numbers) along with their historical ECG data in advance. In addition, it is assumed that the measured ECG signals from the same patient are stable enough (i.e., the measured ECG signal values within a normal range) for both registration (training) and verification (testing) phases of an ECG based authentication scheme. Then the hospital can identify those patients with ECG based biometric authentication scheme next time the patients enter the hospital. Notice that a well trained ECG user authentication model (or scheme) can identify a patient by evaluating live ECG signals in a very short period of time (less than a couple of seconds) in comparison with questioning for the patient's name and his/her legal identity number by a nurse (it may take a couple of minutes). For patients losing consciousness in an emergency room, ECG based user (or patient) authentication can easily identify those patients. In general, a

patient authentication in hospitals may be one of the major application environments for ECG based authentication schemes. This HOS use case is the most widely applied research environment in healthcare and medical industry. There are a lot of public available databases containing historical ECG data such as the PhysioBank database.

Because of complexity for data collecting operations, the received ECG data could be flipped or contain certain noises caused by PLI or wrong position placement of electrodes. Therefore, it is necessary to perform data pre-processing mechanisms onto these ECG data to further improve data quality before using them to train evaluation model for user (or patient) authentication purpose.



In above screen person ID is Authenticated or Identified as 'Person ID 9' and similarly you can upload any other test data and authenticate user. Now click on 'All Algorithms Comparison Graph' button to get accuracy graph of all algorithm.

CONCLUSION

As new ECG detection devices become portable, lightweight, embeddable with smart phones and wearable devices, and connectable with remote servers through wireless technologies in the near future, ECG based biometric authentication will be deployed on massive application systems all over the world. To get high accuracy on user authentication, ML techniques are generally adopted to build a more robust evaluation model for ECG based biometric authentication. In this paper a generalized machine learning framework for ECG based biometric authentication is introduced. The proposed framework describes the general data processing flow of a ML-based ECG authentication mechanism along with

various function features to help researchers easily design and evaluate a ML-based ECG user authentication scheme. Those functions include three general authentication categories for ECG user authentication, three new data pre-processing techniques, a time slicing technique to generate high quality ECG datasets, four new data quality metrics, and a publicly available Matlab Toolbox (i.e., amgecg Toolbox). For people using ML technologies to investigate other topics instead of ECG based biometric authentication, several data pre-processing techniques and newly defined measure metrics offered by the proposed framework are still useful and can help researchers accelerate the development of their ML-based schemes.

REFERANCES

[1] Q. Zhang, D. Zhou, and X. Zeng, ‘‘HeartID: A multiresolution convolutional neural network for ecg-based biometric human identification in smart health applications,’’ IEEE Access, vol. 5, pp. 11805–11816, 2017.

[2] J. R. Pinto, J. S. Cardoso, and A. Lourenço, ‘‘Evolution, current challenges, and future possibilities in ECG biometrics,’’ IEEE Access, vol. 6, pp. 34746–34776, 2018.

[3] E. J. da Silva Luz, G. J. P. Moreira, L. S. Oliveira, W. R. Schwartz, and D. Menotti, ‘‘Learning deep off-the-person heart biometrics representations,’’ IEEE Trans. Inf. Forensics Security, vol. 13, no. 5, pp. 1258–1270, May 2018.

1https://github.com/amangkim/amgecg_toolbox

2http://youtu.be/texyM7Gzz3c

[4] H. Kim and S. Y. Chun, ‘‘Cancelable ECG biometrics using compressive sensing-generalized likelihood ratio test,’’ IEEE Access, vol. 7, pp. 9232–9242, 2019.

[5] Y. Xin, L. Kong, Z. Liu, Y. Chen, Y. Li, H. Zhu, M. Gao, H. Hou, and C. Wang, ‘‘Machine learning and deep learning methods for cybersecurity,’’ IEEE Access, vol. 6, pp. 35365–35381, 2018.

[6] H. J. Kim and J. S. Lim, ‘‘Study on a biometric authentication model based on ECG using a fuzzy neural network,’’ Proc. IOP Conf. Ser., Mater. Sci. Eng., vol. 317, Mar. 2018, Art. no. 012030.

[7] J. R. Pinto, J. S. Cardoso, A. Lourenço, and C. Carreiras, ‘‘Towards a continuous biometric system based on ECG signals acquired on the steering wheel,’’ Sensors, vol. 17 no. 10, p. 2228, 2017.

[8] M. Sansone, R. Fusco, A. Pepino, and C. Sansone, ‘‘Electrocardiogram pattern recognition and analysis based on artificial neural networks and support vector machines: A review,’’ J. Healthcare Eng., vol. 4, no. 4, pp. 465–504, Jun. 2013.

[9] A. E. Saddik, J. S. A. Falconi, and H. A. Osman, ‘‘Electrocardiogram (ECG) biometric authentication,’’ U.S. Patent 9 699 182 B2, Jul. 4, 2017.

[10] S. Y. Chun, J.-H. Kang, H. Kim, C. Lee, I. Oakley, and S.-P. Kim, ‘‘ECG based user authentication for wearable devices using short time Fourier transform,’’ in Proc. 39th Int. Conf. Telecommun. Signal Process. (TSP), Jun. 2016, pp. 656–659.

[11] A. F. Hussein, A. K. AlZubaidi, A. Al-Bayaty, and Q. A. Habash, ‘‘An IoT real-time biometric authentication system based on ECG fiducial extracted features using discrete cosine transform,’’ Aug. 2017, arXiv:1708.08189. [Online]. Available: https://arxiv.org/abs/1708.08189

A AN EXPERIMENTAL STUDY FOR SOFTWARE QUALITY PREDICTION WITH MACHINE LEARNING METHODS

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ABSTRACT:

Software quality estimation is an activity needed at various stages of software development. It may be used for planning the project's quality assurance practices and for benchmarking. In earlier previous studies, two methods (Multiple Criteria Linear Programming and Multiple Criteria Quadratic Programming) for estimating the quality of software had been used Also, C5.0, SVM and Neutral network were experimented with for quality estimation. These studies have relatively low accuracies. In this study, we aimed to improve estimation accuracy by using relevant features of a large dataset. We used a feature selection method and correlation matrix for reaching higher accuracies. In addition, we have experimented with recent methods shown to be successful for other prediction tasks. Machine learning algorithms such as Xgboost, Random Forest and Decision Tree are applied to the data to predict the software quality and reveal the relation between the quality and development attributes. The experimental results show that the quality level of software can be well estimated by machine learning algorithms.

Keywords:SVM, ML, AI, software quality, multiple criteria.

1. INTRODUCTION:

Software applications may contain defects, originating from requirements analysis, specification and other activities conducted in the software development. Therefore, software quality estimation is an activity needed at various stages

STAGES:

[1]. It may be used for planning the project based quality assurance practices and for

benchmarking. In addition, the number of defects per unit is considered one of the most important factors that indicate the quality of the software.

[2].There is two directly comparable studies on software quality prediction using defect quantities in ISBGS dataset. In the first study, the two methods (MCLP and MCQP) were experimented with the dataset and the results were compared

[3]. The quality level was classified according to: number of minor defect + 2*number of major defect + 4*number of extreme defect. The quality of level was to be either high or low. They used k-fold cross-validation technique to measure MCLP and MCQP's performance on the ISBSG database. Release 10 Dataset (released in January 2007) which contained 4,017 records and 106 attributes was used. After preprocessing, 374 records and 11 attributes remained in the dataset. In another study, the same data set was used again.

[4]. The software belonged to high quality class if it fulfills the following requirements: the extreme defects exist or the number of major defects is more than 1 or the number of minor defects is more than 10. The rest are assumed to belong to low quality class. After preprocessing, 746 projects and 53 attributes remained in the dataset. They used C5.0, SVM and Neutral network for classification. As an example to a more application oriented study Rashid et al.

[5] Used case based reasoning (CBR) for software quality estimation. CBR is a machine learning model which performs the learning process using the results of the previous experiments. Line of code, number of function, difficulty level, and development type and programmers experience are entered and these attributes are used for estimation. The deviation is calculated by using Euclidian distance (ED) or The Manhattan distance (MD). If the error in estimation is less than 10% then the record is saved to the database. Number of inputs that can be obtained from the user is limited. Also, it is necessary to have close values in the database in order to estimating precise values.

2. LITERATURE SURVEY

Software quality metrics in quality assurance to study the impact of external factors related to time:

Software quality assurance is a formal process for evaluating and documenting the quality of the work products during each stage of the software development lifecycle. The practice of applying software metrics to operational factors and to maintain factors is a complex task. Successful software quality assurance is highly dependent on software metrics. It needs linkage the software quality model and software metrics through quality factors in order to offer measure method for software quality assurance. The contributions of this paper build an appropriate method of Software quality metrics application in quality life cycle with software quality assurance. Design: The purpose approach defines some software metrics in the factors and discussed several software quality assurance model and some quality factors measure method. Methodology: This paper solves customer value evaluation problem are: Build a framework of combination of software quality criteria. Describes software metrics. Build Software quality metrics application in quality life cycle with software quality assurance. Results: From the appropriate method of Software quality metrics application in quality life cycle with software quality assurance, each activity in the software life cycle, there is one or more QA quality measure metrics focus on ensuring the quality of the process and the resulting product. Future research is need to extend and improve the methodology to extend metrics that have been validated on one project, using our criteria, valid measures of quality on future software project.

Software defect prediction: do different classifiers find the same defects:

During the last 10 years, hundreds of different defect prediction models have been published. The performance of the classifiers used in these models is reported to be similar with models rarely performing above the predictive performance ceiling of about 80% recall. We investigate the individual defects that four classifiers predict and analyse the level of prediction uncertainty produced by these classifiers. We perform a sensitivity analysis to compare the performance of Random Forest, Naïve Bayes, RPart and SVM classifiers when predicting defects in NASA, open source and commercial datasets. The defect predictions that each classifier makes is captured in a confusion matrix and the prediction uncertainty of each classifier is compared. Despite similar predictive

performance values for these four classifiers, each detects different sets of defects. Some classifiers are more consistent in predicting defects than others. Our results confirm that a unique subset of defects can be detected by specific classifiers. However, while some classifiers are consistent in the predictions they make, other classifiers vary in their predictions. Given our results, we conclude that classifier ensembles with decision-making strategies not based on majority voting are likely to perform best in defect prediction.

A Knowledge Discovery Case Study of Software Quality Prediction:

Software becomes more and more important in modern society. However, the quality of software is influenced by many un-trustworthy factors. This paper applies MCLP model on ISBSG database to predict the quality of software and reveal the relation between the quality and development attributes. The experimental result shows that the quality level of software can be well predicted by MCLP Model. Besides, several useful conclusions have been drawn from the experimental result.

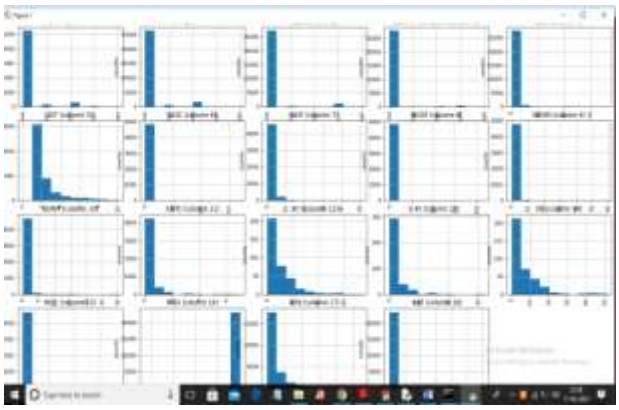
Evidence-based software portfolio management:

In this paper we describe and evaluate a tool for Evidence-Based Software Portfolio Management (EBSPM) that we developed over time in close cooperation with software practitioners from The Netherlands and Belgium. Objectives: The goal of the EBSPM-tool is to measure, analyze, and benchmark the performance of interconnected sets of software projects in terms of size, cost, duration, and number of defects, in order to support innovation of a company's software delivery capability. The tool supports building and maintaining a research repository of finalized software projects from different companies, business domains, and delivery approaches. Method: The tool consists of two parts. First, a *Research Repository*, at this moment holding data of for now 490 finalized software projects, from four different companies. Second, a *Performance Dashboard*, built from a so-called *Cost Duration Matrix*. Results: We evaluated the tool by describing its use in two practical applications in case studies in industry. Conclusions: We show that the EBSPM-tool can be used successfully in an

industrial context, especially regarding its benchmarking and visualization purposes.

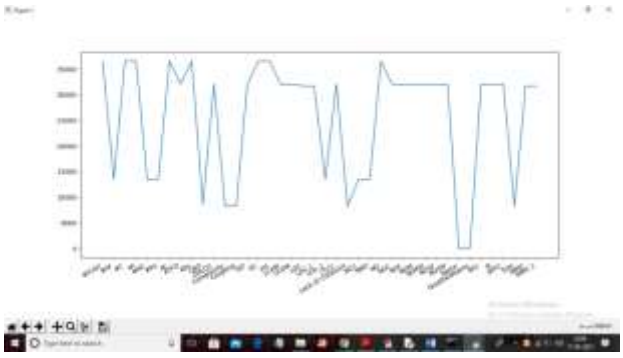
3. METHODOLOGY

Secondly, feature importance table reveal the relationship of the target class with other selected classes. Among the best of the factors selected to estimate the quality, it is revealed that the most influencing attribute of the dataset is the Number of Defects. We used Python scikit-learn library for implementing the models. Training and test data were separated by %33-%67 ratio. Multi-class classification algorithms in the scikit-learn library was used for estimation.



In above graph we can see each graph represents one column from dataset and from that columns its counting each distinct value from and plot in that graph for example in second graph NOC columns 3 different values and its plotting 3 different bars with count and no close above graph to get below screen

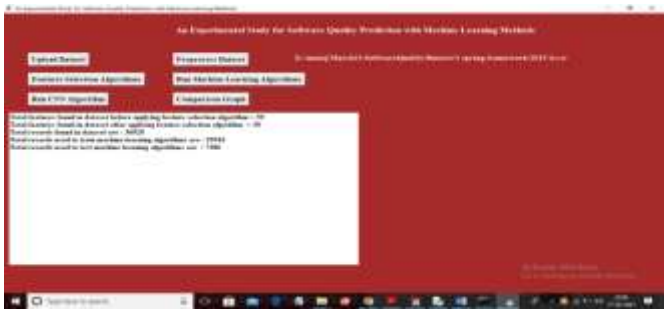
In above screen displaying values from dataset and we can see dataset contains NAN (missing values) and string non numeric values and we need to replace all missing and non-numeric values with their count so click on 'Preprocess Dataset' button



In above graph x-axis represents column names and y-axis represents total missing values counts in that column and now close above graph to get below screen

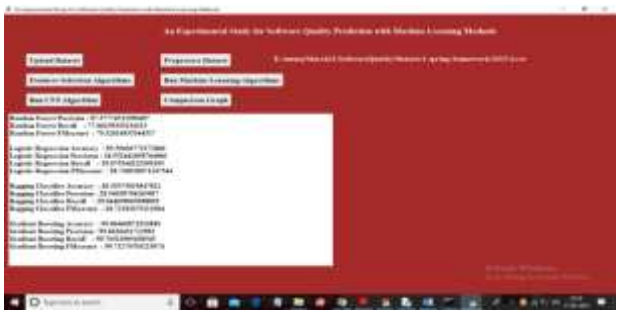
In above screen all missing an string values are replace with numeric values and now click on 'Features Selection Algorithms' button to select important features from dataset and then split dataset into train and test part

In above graph the box which contains value >0.5 will be consider as important attributes and now close above graph to get below screen

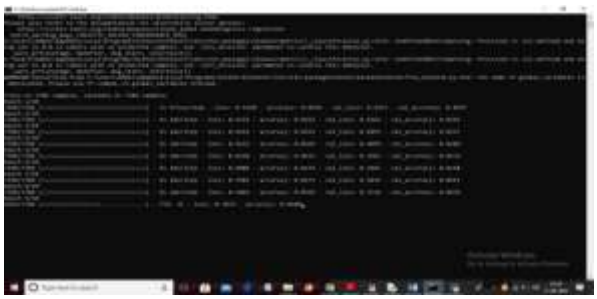


In above screen before applying feature selection algorithm dataset contains 39 features/columns and after applying PCA feature selection we got 30 important features and dataset contains 36928 records and application using 7386 records for testing and 29542 records for training and now both train and test dataset is ready and now click on 'Run Machine Learning Algorithms' button to run all machine learning algorithms

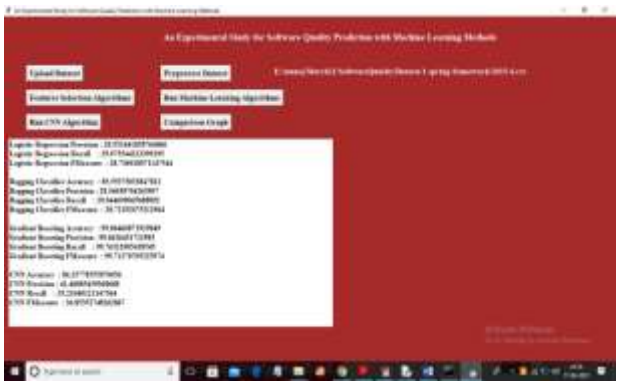
In above screen we can precision, recall, accuracy and fscore for all algorithms



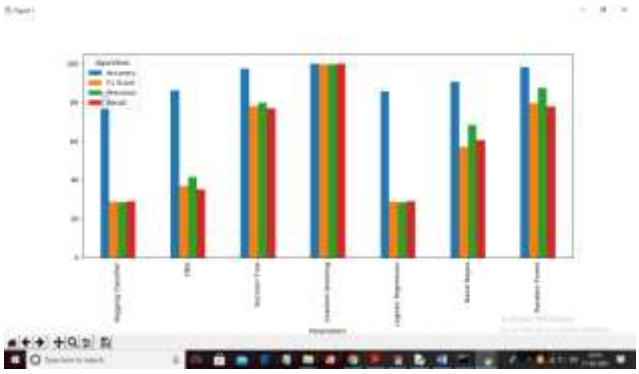
Now click on 'Run CNN Algorithm' button to run CNN algorithm and to get below screen



In above screen to train CNN we took 10 iterations or epoch and at each epoch accuracy get better and loss get reduce and after 10 iterations will get below screen



In above screen we got output values for CNN also and now click on 'Comparison Graph' button to get below screen



In above graph we are plotting accuracy, precision, recall and accuracy for each algorithm

CONCLUSION

In this paper we have experimented classification algorithms using Scikit-learn library on two dataset. We have experimented with recent algorithms that support multi-class classification. The accuracies achieved by using these algorithms are 92.28% on EBSPM Dataset and 92.22% on ISBSG Dataset. In comparison to previous directly comparable studies, acceptable level multiclass quality prediction could be achieved.

REFERANCES

[1] Vijay, T. John, D. M. G. Chand, and D. H. Done. "Software quality metrics in quality assurance to study the impact of external factors related to time." International Journal of Advanced Research in Computer Science and Software Engineering, 2017.

[2] D. Bowes, T. Hall, and J. Petrić, "Software defect prediction: do different classifiers find the same defects?." Software Quality Journal, 26(2), 2018, pp. 525-552.

[3] X. Wang, Y. Zhang, L. Zhang and Y. Shi, "A Knowledge Discovery Case Study of Software Quality Prediction: ISBSG Database," 2010 IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology, Toronto, ON, 2010, pp. 219-222.

[4] X. Wang, Y. Zhang, L. Zhang and Y. Shi, "A Knowledge Discovery Case Study of Software Quality Prediction Based on Classification Models: ISBSG Database," The 11th International Symposium on Knowledge Systems Sciences (KSS 2010), 2010

[5] E. Rashid, S. Patnaik, and V. Bhattacherjee, "Software quality estimation using machine learning: Case-Based reasoning technique, " International Journal of Computer Applications, 2012

[6] www.isbsg.org

[7] https://goverdson.nl/

[8] H. Huijgens,"Evidence-based software portfolio management: a tool description and evaluation", 20th International Conference on Evaluation and Assessment in Software Engineering (EASE '16), 201

AUTHENTICATION OF PRODUCT & COUNTERFEITS ELIMINATION USING BLOCKCHAIN

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ABSTRACT:

Blockchain technologies have gained interest over the last years. While the most explored use case is financial transactions, it has the capability to agitate other markets. Blockchain remove the need for trusted intermediaries, can facilitate faster transactions and add more transparency. This paper explores the possibility to deflate counterfeit using blockchain technology. This paper provides an overview of different solutions in the anti-counterfeit area, different blockchain technologies and what characteristics make blockchain especially interesting for the use case. We have developed three different concepts and the expansion of an existing system concept, is pursued further. It is shown, that reducing counterfeits cannot be achieved by using technological means only. Increasing awareness, fighting counterfeiters on a legal level, a good alert system, and having tamper-proof packaging are all important aspects. These factors combined with blockchain technology can lead to an efficient and comprehensive approach to reduce counterfeiting.

Keywords: Block Chain, bit coin, High efficiency, QR code, RFID.

1. INTRODUCTION:

Although it may seem like a far off idea, we are surrounded by a lot of counterfeits. From fashion and retail products to software, digital media, electronics, piracy, and intellectual property, reports put the cost of counterfeiting somewhere around $600bn a year in the US alone. In fact, the International Chamber of Commerce predicts that the ―negative impacts of counterfeiting and piracy are projected to drain US$4.2 trillion from the global economy and put 5.4 million legitimate jobs at risk by 2022. In Pharmaceuticals, the counterfeit medicine market is now responsible for around 1 million deaths per year, in an industry estimated to be worth $75bn annually. In fact, the counterfeit medicine industry is estimated to be growing at twice the rate of

legitimate pharmaceuticals, making it up to 25 times more lucrative than the global narcotics trade. Trust is a central element in all transactions. No matter if sending money or exchanging goods, it becomes difficult if there is no trust between the entities involved. It becomes even more difficult, as with many transactions, third parties are involved, such as banks. Often, not only one third-party is involved in a transaction, but multiple. An international money transfer does not only include the bank of the sender, the bank of the receiver, but also multiple intermediary entities such as clearing houses. The entities involved in the transaction do not only have to trust each other, but also the third parties. Removing these third parties can decrease transaction cost, facilitate faster transactions and add more transparency. Bitcoin has successfully shown that removing such third-parties is possible. The cryptocurrency permits direct sending coins to a transaction partner, without the need to use banks and clearing houses. The assets are directly transferred from one account to another. There are no intermediaries and thereby no need to trust third parties. In addition, the question if a transaction is valid is not answered by an institution, but by algorithms used. Therefore, it completely removes the need to trust any third party. The technology behind Bitcoin, the blockchain, can however not only be used for financial transactions and crypto currencies in general. The technology has potential to ―redefine the digital economy‖ [10], because it allows immutable transactions, which can be checked at all times from everyone. This is because the information is publicly available and distributed globally. It is ―chronologically updated and cryptographically sealed‖ [11]. The full range of applicable use cases for this technology has to be seen, but tracking ownership and history of a product is surely one of them [12]. This paper explores the possibility to reduce counterfeit using blockchain technology. Authentication ,the act of establishing or conforming something as genuine. Authentication is of utmost importance because the use of counterfeit medicines can be harmful to the health and wellbeing of the patients. Their use may result in treatment failure or even death. Authentication is generally done through the overt or covert features upon the product. We now have more fakes than real drugs in the market.‖ — Christophe Zimmermann, the anti-counterfeiting and piracy coordinator of the World Customs Organization [6]. Current anti-counterfeiting supply chains rely on a centralized authority to combat counterfeit products. This architecture results in issues such as single point processing, storage, and failure. Blockchain technology has emerged to provide a promising solution for such issues. In this paper, we propose the block-supply chain, a new decentralized

supply chain that detects counterfeiting attacks using blockchain and Near Field Communication (NFC) technologies. Block-supply chain replaces the centralized supply chain design and utilizes a new proposed consensus protocol that is, unlike existing protocols, fully decentralized and balances between efficiency and security. Our simulations show that the proposed protocol offers remarkable performance with a satisfactory level of security compared to the state of the art consensus protocol Tendermint.

2. LITERATURE SURVEY:

[1] JINHUA MA , SHIH-YA LIN , XIN CHEN , HUNG-MIN SUN , YEH-CHENG CHEN AND HUAXIONG WANG proposed the paper "A Blockchain-Based Application System for Product Anti-Counterfeiting",2020 describe a decentralized Blockchain system with products ant counterfeiting, in that way manufacturers canuse this system to provide genuine products without having to manage direct-operated stores, which can significantly reduce the cost of product quality assurance and can assure that the consumers getting genuine products without the involvement of trusted intermediaries. [2]HOAI LUAN PHAM, THI HONG TRAN and YASUHIKO NAKASIMA proposed the paper "Practical Anti-Counterfeit Mesicine management System Based on Technology",2019 which describes a novel Blockchain based product ownership management method for product ownership management method for anti-counterfeit medicine system to resist the cloning of drug and improve the practical applicability. Analysys and evaluation results of our proposed system outperform the related proposals based on criteria about a practical application, anti-clone, low cost oriented, and scalability. Furthermore, experimental implementation on a small scale shows that our proposed system works appropriately in a real environment.

Anti-counterfeiting solutions should protect organizations from financial and reputation losses, and, especially in the case of pharmaceutical products, customer safety. [15] argues that good anti-counterfeiting techniques should generally be simple to apply, but difficult to imitate and have four main features: They should be difficult to duplicate, it should be possible to identify them without special equipment, it should be difficult to re-use them, and it should be visible if they were tampered with. From a product perspective, there are three general technologies to reduce counterfeits [15]: Overt (Visible) Features expected to assist the users to confirm the genuineness of a pack. Such features will be significantly visible, and complex or expensive to reproduce.[16] . This includes holograms, color shifting inks, security threads, water marks etc. The advantage of overt technologies is that they can be checked by the

end consumer. Covert (Hidden) Features the rationale of a covert feature is to aid the brand owner to recognize a counterfeit product. The general public will not be aware of its presence nor will have the resources to confirm it. This includes UV, bi-fluorescent and pen-reactive ink, as well as digital watermarks and hidden printed messages. Covert technologies help to identify counterfeits in the supply-chain and are especially efficient combined with overt technologies. Track and trace includes Radio Frequency Identification (RFID) tags, Electronic Product Codes (EPCs) and barcodes. Track and trace technologies allow for simpler tracing of products, thereby enabling the reduction of counterfeits, as the history of a product is available. The tag or barcode is included by the manufacturer. Distributors scan the identification, enabling them to check the authenticity of the product and update the status. Finally, retailers can also scan the product, to check the history and authenticity of the product. This approach does not only tackle the counterfeit problem, but also enables track and trace through the whole product lifecycle.

Existing System:

Existing In this paper author is using Blockchain technology to authenticate supply chain products as this products may be supplied from multiple third party distributors and this distributors can make clone/fake/counterfeits of this product BAR CODE and then manufacture fake products and add this counterfeit label to fake product and this fake products can cause huge loss of financial and lives if fake medicine manufacture. Not only supply chain any other online transaction require third party to complete transaction and peoples has to trust on third parties to complete their transaction and sometime this third parties can make fraud transaction or misuse user data.

3. METHODOLOGY

To avoid this problem author using Blockchain technology which does not require any third party and verification will be done by software algorithm itself without involvement of any third party.In this to avoid forge counterfeit we are converting all products details/barcode into digital signatures and this digital signatures will be stored in Blockchain server as this Blockchain server support tamper proof data storage and nobody can hack or alter its data and if by an chance if its data alter then verification get failed at next block storage and user may get intimation about data alter.

WORKING:

In this paper author is using Blockchain technology to authenticate supply chain products as this products may be supplied from multiple third party distributors and this distributors can make clone/fake/counterfeits of this product BAR CODE and then manufacture fake products and add this counterfeit label to fake product and this fake products can cause huge loss of financial and lives if fake medicine manufacture.

Not only supply chain any other online transaction require third party to complete transaction and peoples has to trust on third parties to complete their transaction and sometime this third parties can make fraud transaction or misuse user data.

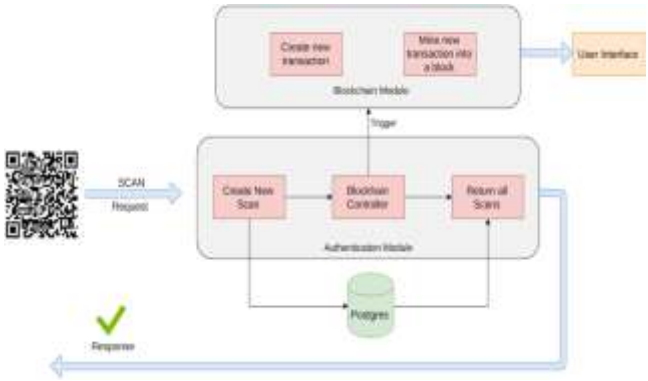

Fig.3.1. System Design model.

To avoid this problem author using Blockchain technology which does not require any third party and verification will be done by software algorithm itself without involvement of any third party.In this to avoid forge counterfeit we are converting all productsdetails/barcode into digital signatures and this digital signatures will be stored in Blockchain server as this Blockchain server support tamper proof data storage and nobody can hack or alter its data and if by an chance if its data alter then verification get failed at next block storage and user may get intimation about data alter. In Blockchain technology same transaction data stored at multiple server with hash code verification and if data alter at one server then it will detected from other server as for same data hash code will get different. For example in Blockchain technology data will be stored at multiple servers and if malicious users alter data at one server then its hash code will get changed in one server and other servers left unchanged and this changed hash code will be detected at verification time and future malicious user changes can be prevented. In supply chain also all products barcode digital Blockchain signatures will be stored and if any third party distributor make clone of barcode then its signature will be mismatch and counterfeit will be detected. In Blockchain each data will be stored by verifying old hash codes and if old hash codes remain unchanged then data will be consider as original and unchanged and then new transaction data will be appended to Blockchain as new block. For each new data storage all blocks hash code will be verified.

In above screen I am selecting and uploading '2.jpg' file and then click on 'Open' button to get below result

In above screen in browser author can see all authentication details uploaded product bar code. Now check with fake barcode by uploading from 'fake bar code' folder

In above screen uploading barcode from fake folder and below is the result

In above screen in text area we can see uploaded bar code authentication failed.

CONCLUSION

With this system, the products journey from manufacturing to customer can be recorded, and the customer is assured that the scans weren't faked. Manufacture is able to prove their product is authentic and is also able to track their product's pathway. The setup is easy to implement and requires less operation cost. Manufacturer can also adopt RFID or NFC tokens instead of QR codes to further strengthen their system.

REFERANCES

[1] Satoshi Nakamoto, ―Bitcoin: A Peer-to-Peer Electronic Cash System‖, 2008

[2] Hyperledger, ―Hyperledger Blockchain Performance Metrics‖, V1.01, October 2018

[3] R.C. Merkle, "Protocols for public key cryptosystems," In Proc. 1980 Symposium on Security and Privacy, IEEE Computer Society, pages 122-133, April 1980.

[4] Armin Ronacher, ―Flask Docs‖, http://flask.pocoo.org/docs/‖

[5] G. Wood, __Ethereum: A secure decentralised generalized transaction ledger,'' Tech. Rep., 2014.

[6] OECD (2016), Illicit Trade: Converging Criminal Networks, OECD Reviews of Risk Management Policies, OECD Publishing, Paris, https://doi.org/10.1787/9789264251847-en.

[7] M. Castro and B. Liskov, __Practical byzantine fault tolerance and proactive recovery,'' ACM Trans. Comput. Syst., vol. 20, no. 4, pp. 398–461, Nov. 2002.

[8] Clement, E. Wong, L. Alvisi, M. Dahlin, and M. Marchetti, __Making byzantine fault tolerant systems tolerate byzantine faults,'' in Proc. 6th USENIX Symp. Netw. Syst. Design Implement., 2009, pp. 153–168.

[9] Cachin, __Architecture of the hyperledger blockchain fabric,'' Tech. Rep., Jul. 2016..

[10] S. Underwood, ―Blockchain Beyond Bitcoin‖, in Communications of the ACM, vol. 59, no. 11, p. 15-17, 2016.

[11] Deloitte, Israel: A Hotspot for Blockchain Innovation, 2016. [Online]. Available: https://www2.deloitte.com/content/dam/ Deloitte/il/Documents/financial-services/israel_a_hotspot_for_blockchain_innovation_ feb2016_1.1.pdf. [Accessed: 2.11.2016].

AUTOMATIC DETECTION OF DIABETIC RETINOPATHY USING CNN

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ABSTRACT:

A Convolutional Neural Networks (CNNs) approach is proposed to automate the method of Diabetic Retinopathy(DR) screening using color fundus retinal photography as input. Our network uses CNN along with denoising to identify features like micro-aneurysms and haemorrhages on the retina. Our models were developed leveraging Theano, an open source numerical computation library for Python. We trained this network using a high-end GPU on the publicly available Kaggle dataset. On the data set of over 30,000 images our proposed model achieves around 95% accuracy for the two class classification and around 85% accuracy for the five class classification on around 3,000 validation images

Keywords: CNN, Haemorrhages, kaggle dataset, python.

1. INTRODUCTION:

Diabetic Retinopathy (DR) is an eye disease that damages the retina of patients with long-standing diabetes. This is an ocular complication of the eye that affects 75% of diabetic patients leading to blindness in the age group of 20-64 [1]. There are different ways to diagnose DR. The World Health Organization reports that about 347 million people in the world are affected by DR. About 366 million adults with diabetes is estimated by International Diabetes Federation. This figure is expected to rise to 552 million by 2030. Estimated occurrence of type 2 diabetes mellitus and diabetic retinopathy is quite high in India, according to the studies that have been conducted so far. Based on a survey in 2000, the top three countries with highest number of diabetes mellitus are India (31.7 million), China (20.8 million) and USA (17.7 million) [2]. Trained clinicians are required to examine the color fundus photographs of retina and detect DR. The process of identifying DR involves detection

of lesions with vascular abnormalities. This is an effective way of detection but requires the service of experienced clinicians for analysis of the photographs manually, which is time-consuming. Rural areas, where the rate of diabetes is usually high, lack the expertise of well-trained clinicians and sophisticated equipment that are necessary for detection of DR. Better infrastructure with automated detection techniques are now required to tackle the growing number of individuals with diabetes. An early detection can help to avert or decrease the spread of DR which otherwise might cause blindness [3]. Previous research work for identification of the stages of DR using automated techniques includes support vector machines [4] and k-NN classifiers [5]. Most of the methods treat this as a two-class classification problem for detection of DR.

2. EXISTING SYSTEM:

Numerous techniques are tested by researchers in the area for DR classification with encouraging results. Recent work for addressing blood vessel segmentation includes the application of CNN (LeNet-5 architecture) as feature extractor .Three heads are used in this model at different layers of the convnent which are then fed into three random forests. The final classifier achieved an accuracy of 0.97 and 0.98 on the DRIVE and STARE dataset. An automatic segmentation of blood vessels in color fundus images is implemented by M.Melinscak et al using deep max-pooling convnet to separate the blood vessels. The model contains a deep max-pooling convolutional neural networks to segment blood vessels. It deployed 10-layer architecture for achieving a maximum accuracy of around 0.94. It was carried around 4-convolutional and 4-max pooling layer with 2 additional fully connected layers for vessel segmentation. Automated analysis of DR using images processing techniques are introduced by Adarsh et al. In this approach, extraction of retinal blood vessels, exudate, micro-aneurysms, haemorrhages and texture features takes place, followed by construction of Multiclass SVM using area of lesions and texture features. Impressive results are reported using the publicly available datasets DIARETDB0 and DIARETDB1 with accuracy of 0.96 and 0.946 respectively.

PROPOSED SYSTEM:

A. Overview

Data is collected from the dataset provide by the Kaggle coding website and maintained by EyePacs. The dataset consists of colour

fundus photographs collected from various sources. The images are classified based on the severity of DR, where each image was assigned to a class by a trained clinician1. The figure below shows the various stages of diabetic retinopathy(DR)

B. Class Imbalance:

The class labels of the dataset are highly imbalanced i.e more than 73% of the class are negative, which makes our model difficult to train. Table I below shows the class proportion statistics, where PDR and NPDR refers to proliferative and Non-proliferative DR respectively.

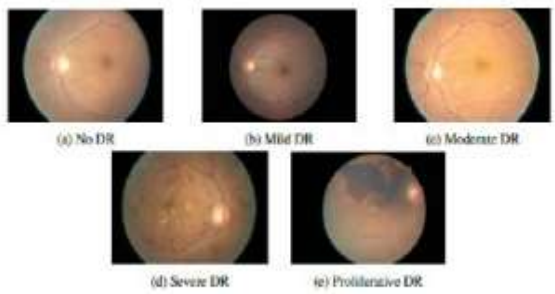


Fig. 1. Diabetic Retinopathy(DR) stages

Class	Number	Percentage
Negative	25810	73.5%
Mild NPDR	2443	6.90%
Moderate NPDR	5292	15.10%
Severe NPDR	873	2.50%
PDR	708	2.00%

TABLE I. CLASS IMBALANCE.

FEATURES SELECTION:

A. Pre-processing:

The dimension of images in the dataset is 3000x2000 pixels. For convenient use of the CNN using the resources at our disposal, the images are cropped and resized to squares of 512 pixels.

B. Data Augmentation:

Augmented images were created to increase the class size as there was limited number of training samples for some of the classes. Brightness of each of the images created after pre-processing were adjusted by converting the RGB image to float representation followed by converting into the original data type. This is done by adding a delta value to all the components of the image. The images are scaled appropriately and both the image and delta are converted to float prior to addition. As the addition to the image is performed in floating point representation, the delta must be in the range [0,1) whereas the pixel values are in [0,1). The original and the brightness adjusted images are then rotated by 90 and 180 degree which inherently increase the class size 6 times. This makes our mod

del immune to different orientations and lighting conditions.

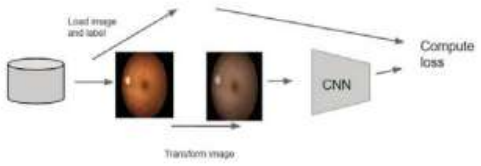


Fig. 2. Data Augmentation

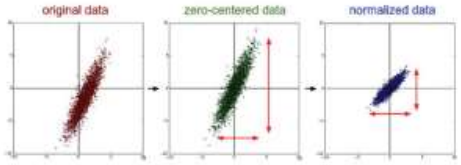
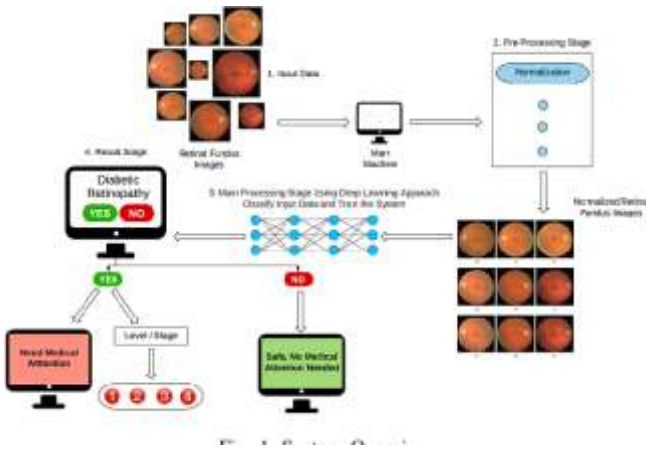


Fig. 3. Normalizing

In this approach, extraction of retinal blood vessels, exudate, micro-aneurysms, haemorrhages and texture features takes place, followed by construction of Multiclass SVM using area of lesions and texture features. Impressive results are reported using the publicly available datasets DIARETDB0 and DIARETDB1 with accuracy of 0.96 and 0.946 respectively. Considering the heterogeneity of the dataset, the performance of the proposed model is satisfactory. The accuracy of the model can be increased by using other complex denoising techniques.



3. METHODOLOGY

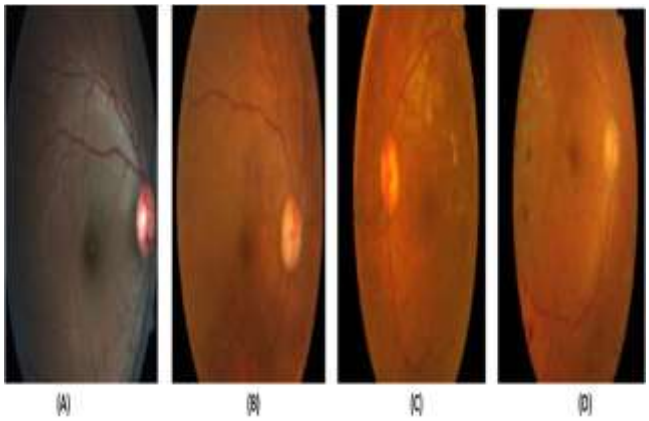
Upload MRI images dataset: use this button to get upload images.

Generate images train & test model: use this button to get generate images train & test model.

Generate deep learning CNN model: use this button to get deep learning CNN model.

Get drive HQ images: using this button to get open drive HQ

Predict tumor: use this button to get predict tumor.



CONCLUSION

A model is presented for classification of DR stages based on the severity using color fundus images. The performance of the model is assessed using different metrics. Considering the heterogeneity of the dataset, the performance of the proposed model is satisfactory. The accuracy of the model can be increased by using other complex denoising techniques. Incorporating experimental errors during image capture will be helpful in developing more efficient normalization methods.

REFERANCES

[1] Michael M. Engelgau, Linda S. Geiss, Jinan B. Saaddine, James P. Boyle, Stephanie M. Benjamin, Edward W. Gregg, Edward F. Tierney, Nilka Rios-Burrows, Ali H. Mokdad, Earl S. Ford, Giuseppina Imperatore, and K. M. Venkat Narayan. The evolving diabetes burden in the united states. Annals of Internal Medicine, 140(11):945–950, 2004.

[2] Cornwall J. Kaveeshwar SA. The current state of diabetes mellitus in India. The Australasian Medical Journal, pages 45–48, 2014.

[3] R. Williams, M. Airey, H. Baxter, J. Forrester, T. Kennedy-Martin, and A. Girach. Epidemiology of diabetic retinopathy and macular oedema: a systematic review. Eye, 18(10):963–983, Jul 2004.

[4] Shantala Giraddi, Jagadeesh Pujari, and Shivanand Seeri. Article: Identifying abnormalities in the retinal images using svm classifiers. International Journal of Computer Applications, 111(6):5–8, February 2015. Full text available.

[5] Muthu Rama Krishnan Mookiah, U. Rajendra Acharya, Chua Kuang Chua, Choo Min Lim, E.Y.K. Ng, and Augustinus Laude. Computeraided diagnosis of diabetic retinopathy: A review. Computers in Biology and Medicine, 43(12):2136 – 2155, 2013.

[6] Shuangling Wang, Yilong Yin, Guibao Cao, Benzheng Wei, Yuanjie Zheng, and Gongping Yang. Hierarchical retinal blood vessel segmentation based on feature and ensemble learning. Neurocomputing, 149, Part B:708 – 717, 2015.

[7] J.J. Staal, M.D. Abramoff, M. Niemeijer, M.A. Viergever, and B. van Ginneken. Ridge based vessel segmentation in color images of the retina. IEEE Transactions on Medical Imaging, 23(4):501–509, 2004.

[8] Martina Melinscak, Pavle Prentasic, and Sven Loncaric. Retinal vessel segmentation using deep neural networks. pages 577–582, 2015.

[9] P. Adarsh and D. Jeyakumari. Multiclass svm-based automated diagnosis of diabetic

retinopathy. In Communications and Signal Processing (ICCSP), 2013 International Conference on, pages 206–210, April 2013.

[10] Antoni Buades, Bartomeu Coll, and Jean-Michel Morel. A nonlocal algorithm for image denoising. In Proceedings of the 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR'05) - Volume 2 - Volume 02, CVPR '05, pages 60–65, Washington, DC, USA, 2005. IEEE Computer Society.

BLOCKCHAIN BASED CERTIFICATE VALIDATION

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ABSTRACT:

In this project to secure academic certificate and for accurate management and to avoid forge certificate we are converting all certificates into digital signatures and this digital signatures will be stored in Blockchain server as this Blockchain server support tamper proof data storage and nobody can hack or alter its data and if by an chance if its data alter then verification get failed at next block storage and user may get intimation about data alter. In Blockchain technology same transaction data stored at multiple server with hash code verification and if data alter at one server then it will detected from other server as for same data hash code will get different. For example in Blockchain technology data will be stored at multiple servers and if malicious users alter data at one server then its hash code will get changed in one server and other servers left unchanged and this changed hash code will be detected at verification time and future malicious user changes can be prevented. In Blockchain each data will be stored by verifying old hash codes and if old hash codes remain unchanged then data will be consider as original and unchanged and then new transaction data will be appended to Blockchain as new block. For each new data storage all blocks hash code will be verified.

Keywords:Blockchain, Server, tamper, ML.

1. INTRODUCTION:

The project consists in designing and implementing the system which covered the above solutions. The project also involves a comprehensive evaluation of the system security, and the assessment outcomes provide compelling evidence to prove that implementation is practical, reliable, secured, which might give some hints of important architectural considerations about the security attributes of other blockchain-based systems. In this section,

we discuss the implementation from the point of view of system architecture, database architecture. The system architecture and database architecture show how the system is designed from the engineering point of view.

The issuing applications are responsible for the main business logic which include the certificates applying, examining, signing and issuing. The issuing applications are designed to merge the hash of the certificate in a Merkle tree and send the Merkle root to Blockchain amidst signing by the majority of community members. Also, the issuing applications involved the revocation of certificate. The issuing applications are responsible for the main business logic which includes the applying for, examining, signing and issuing of the certificates. The issuing applications are designed to merge the hash of the certificate with a Merkle tree and send the Merkle root to the Blockchain. Also, the issuing applications deal with the revocations of certificates.

The verification application focuses on checking the authenticity and integrity of the certificates that have been issued. It includes two main components: a web-based page and an Android-based application. They use the same mechanism, and fetch the transaction message through the blockchain API and compare the transaction message with the verification data from the receipt. The mechanism can be briefly described in the following way: check the authentication code is valid; check the hash with the local certificate; confirm the hash is in the Merkle tree; ensure the Merkle root is in the blockchain; verify the certificate has not been revoked; validate the expired date of the certificate. Also, it has to be mentioned that for the convenience of sharing the certificates, the Android-based application allows for verification of the documents by scanning the QR code directly. The blockchain acts as the infrastructure of trust and a distributed database for saving the authentication data. Typically, the authentication data consist of the Merkle root generated using hashed data from thousands of certificates. The MongoDB is employed as our database since the MongoDB successfully manages JSON-based certificates and provides high availability and scalability. Advances in information technology, the wide availability of the Internet, and common usage of mobile devices have changed the lifestyle of human beings. Virtual currency, digital coins originally designed for use online, has begun to be extensively adopted in real life. Because of the convenience of the Internet, various virtual currencies are thriving, including the most popular— Bitcoin, Ether, and Ripple [2]—the value of which has surged recently. People are beginning to pay attention to blockchain, the backbone technology of these

revolutionary currencies. Blockchain features a decentralized and incorruptible database that has high potential for a diverse range of uses

Blockchain is a distributed database that is widely used for recording distinct transactions. Once a consensus is reached among different nodes, the transaction is added to a block that already holds records of several transactions. Each block contains the hash value of its last counterpart for connection. All the blocks are connected and together they form a blockchain [1]. Data are distributed among various nodes (the distributed data storage) and are thus decentralized. Consequently, the nodes maintain the database together. Under blockchain, a block becomes validated only once it has been verified by multiple.

2. LITERATURE SURVEY

EXISTING SYSTEM

The certificate are stored in centralized manner and verified manually, so it takes too much time to verify. There is no safety to the certificate that are given to any private sectors (banks).But,thedatas may be changed, deleted or modified. Certificates are easily hacked and make duplicate of that certificate. Students bring their certificates on interview places. There is no security for certificates.

PROPOSED SYSTEM

In this study, a blockchain certificate system was developed based on relevant technology. The system's application was programmed on the Ethereum platform and is run by the EVM. In the system, three groups of users are involved, Schools or certification units grant certificates, have access to the system, and can browse the system database. When students fulfilled certain requirements, the authorities grant a certificate through the system. After the students have received their certificate, they are able to inquire about any certificate they have gained. The service.

3. METHODOLOGY

System Design In this study, a blockchain certificate system was developed based on relevant technology. The system's application was programmed on the Ethereum platform and is run by the EVM. In the system, three groups of users are involved, Schools or certification units grant certificates, have access to the system, and can browse the system database. When students fulfilled certain requirements, the authorities grant a certificate through the system. After the students have received their certificate, they are able to inquire about any certificate they have gained. The service Process Blockchain is a

decentralized distributed database. The working processes of the system developed in this study are as follows: Schools grant a degree certificate and enter the student's data into the system. Next, the system automatically records the serial number of the student in a blockchain. The certificate system verifies all the data. Instead of sending conventional hard copies, schools grant e-certificates containing a quick response (QR) code to the graduates whose data have been successfully verified. Each graduate also receives an inquiry number and electronic file of their certificate. When applying for a job, a graduate simply sends the serial number or e-certificate with a QR code to the target companies. The companies send inquiries to the system and are informed if the serial numbers are validated. The QR code enables them to recognize if the certificate has been tampered with or forged.

Working:

In above screen entered some student details and then click on 'Save Certificate with Digital Signature' button and then selecting and uploading '1.jpg' file and then click on 'Open' button to get below screen

In above screen we can see Blockchain generated previous hash with block no 1 and its current hash and then keep on generating new blocks with each certificate upload and while running you can see that previous hash of new record will get matched with current hash of old record and this matched hash code proof that Blockchain verify old and new hash code before storing new block to confirm data is not altered. So above details stored at Blockchain and now verifier can click on 'Verify Certificate' button and upload same or other images to get below result

In above screen selecting and uploading '1.jpg' file and then click on 'Open' button to get below result

In above screen we uploaded same and correct image so application matched digital signature and then retrieve details from Blockchain and now try with some other image

In above screen selecting and uploading '5.jpg' file and then click on 'Open' button to get below result

In above screen verification got failed as uploaded certificate not matched with stored certificates in Blockchain. Similarly you can upload any other certificate and convert them to digital signature.

CONCLUSION

In June 2016, the MIT media lab released their blockchain-based credential system which is more secure, more reliable and harder to forge, in contrast to existing technologies that based on the third party arbitration. However, there are some serious authentication defects and vulnerable revocation mechanism which limits the prevalence and application of the project. In our project, to solve these problems and make its concept more practical, we proposed and designed a set of innovative cryptographic protocols which includes multi-signature, BTC-address-state-based revocation mechanism and trusted federated identity

Among these protocols, the multi-signature scheme most notably increases the difficulty of forging owing to the fact that each issuing progress is obliged to be signed by the majority of the academic committee members. Besides, it enhances the safety of the private keys storing for the reasons that the private keys are possessed by separated devices and people. Besides, BTC-address-based revocation mechanism improved the stability of the certificate revocation because BTC address is accessible and stable at any time. Moreover, this approach reduced the failure probability of

revocation, because the cancellation process adheres the same the multi-signature algorithm, alike, involving several people. Trusted federated identity innovatively proved the authenticity of the certificate through the trusted path and federated identity. What's more, the protocol of our project can be used in other related realms such as digital right protecting and contract proof. Case in point, our protocol enables the two companies to attach their contract onto the block chain with multisignature, which is different from the traditional third party-based work mode and dispel the worries of forging credentials.

Moreover, we implemented a blockchain-based certificate system, which embraced all the above protocols, by utilizing Java and JavaScript. This system has remedied the defect in Blockcerts to a certain extent, which makes the theory of blockchain-based certificate more practicable. Eventually, we conducted a series of security assessment from the perspective of operational safety, data security, network security and protocol security. The assessment outcomes provide compelling evidence that system is secured enough to meet the enterprise application standards.

Lastly, there are some limitations remained to be discussed, albeit, these considerations fall outside the scope of this paper: Our project is based on the Bitcoin blockchain, the maintenance of which relies on thousands of participants in the cryptocurrency ecosystem. Admittedly, it is imprudent to assume that the Bitcoin would work well continuously in the future because myriad types of stakeholders influence blockchain ecosystem or business model. In the years to come, we will adopt multiple blockchain sources such as Hyperledger and Ethereum to eliminate the factors of instability.

REFERANCES

[1] Tengyu Yu, Blockchain operation principle analysis: 5 key technologies, iThome, https://www.ithome.com.tw/news/105374

[2] JingyuanGao, The rise of virtual currencies! Bitcoin takes the lead, and the other 4 kinds can't be missed. Digital Age, https://www.bnext.com.tw/article/47456/bitcoinether-li tecoin-ripple-differences-betweencryptocurrencies

[3] Smart contractswhitepaper, https://github.com/OSELab/learning-blockchain/blob/ master/ethereum/smart-contracts.md

[4] Gong Chen, Development and Application of Smart Contracts, https://www.fisc.com.tw/Upload/b0499306-1905-4531-888a-2bc4c1ddb391/TC/9005.pdf

[5] Weiwei He, Exempted from cumbersome auditing and issuance procedures, several national

junior diplomas will debut next year.iThome, https://www.ithome.com.tw/news/119252

[6] Xiuping Lin, "Semi-centralized Blockchain Smart Contracts: Centralized Verification and Smart Computing under Chains in the EthereumBlockchain",Department of Information Engineering, National Taiwan University, Taiwan, R.O.C., 2017.

[7] Yong Shi, "Secure storage service of electronic ballot system based on block chain algorithm", Department of Computer Science, Tsing Hua University, Taiwan, R.O.C., 2017.

[8] ZhenzhiQiu, "Digital certificate for a painting based on blockchain technology", Department of Information and Finance Management, National Taipei University of Technology, Taiwan, R.O.C., 2017.

[9] Weiwen Yang, Global blockchain development status and trends,

[10] Benyuan He, "An Empirical Study of Online Shopping Using Blockchain Technology", Department of Distribution Management, Takming University of Science and Technology, Taiwan, R.O.C., 2017.

FINGERPRINT BASED ATM SYSTEM

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ABSTRACT:

The main aim of this project to provide secure banking system, by taking fingerprints as authorized identity at ATM/banks. The purpose of the project is to provide a secured and reliable environment to the customers for their banking transactions by providing a unique identity to every user using the FINGER PRINT identification technology. Identification and verification of a person today is a common thing; which may include door-lock system, safe box and vehicle control or even at accessing bank accounts via ATM, etc which is necessary for securing personal information. The conventional methods like ID card verification or signature does not provide perfection and reliability. The systems employed at these places must be fast enough and robust too. Use of the ATM (Automatic Teller Machine) which provides customers with the convenient banknote trading is facing a new challenge to carry on the valid identity to the customer. Since, in conventional identification methods with ATM, criminal cases are increasing making financial losses to customers. Fingerprint Based ATM is a desktop application where fingerprint of the user is used as a authentication. The finger print minutiae features are different for each human being so the user can be identified uniquely. Instead of using ATM card Fingerprint based ATM is safer and secure. There is no worry of losing ATM card and no need to carry ATM card in your wallet. You just have to use your fingerprint in order to do any banking transaction. The user has to login using his fingerprint and he has to enter the pin code in order to do further transaction. The user can withdraw money from his account. User can transfer money to various accounts by mentioning account number. In order to withdraw money user has to enter the amount he want to withdraw and has to mention from which account he want to withdraw. The user must have appropriate balance in his ATM account to do transaction.

User can view the balance available in his respective account. The system will provide the user to view last 5 transactions.

Keywords: ATM, Biometric module, wallet, High security.

1. INTRODUCTION:

Biometrics is the art of science and technology of measuring and analyzing biological data. If biometrics refers to technologies that measure and analysis human body characteristics, such as DNA, fingerprinting, eye retina and irises, voice pattern, facial pattern and measurement for authentication purposes. Biometrics identifier method provides several advantages over the traditional method and current method used in our daily life. Basically concentrate on two function one is for identification and other verification. A modern ATM is typically made up of the devices like CPU to control the user interface and devices related to transaction, magnetic or chip card reader to identify the customer, Pin pad, secure crypto-processor generally within a secure cover.

Display to be used by the customer for performing the transaction, function key button, record printer to provide the customer with a record of their transaction, to store the parts of the machinery requiring restricted access- vault, housing for aesthetics, sensors and indicators. In this modern era there are many people using ATM. Fast development of banking has various advantages and disadvantages.

The main objective of this system is to develop an embedded system, which is used for ATM security applications. In this system, Bankers will collect the customer finger prints while opening the accounts then customer will only access ATM machine. The working of these ATM machine is when customer place finger on the finger print module it displays the name of the customer on the LCD connected to the micro controller. If the user does not have an account activated by a fingerprint initially it does not allow the user to do transactions. Nowadays, using the ATM (Automatic Teller Machine) which provides customers with the convenient banknote trading is very common. However, the financial crime case rises repeatedly in recent years; a lot of criminals tamper with the ATM terminal and steal user's credit card and password by illegal means. Once user's bank card is lost and the password is stolen, the criminal will draw all cash in the shortest time, which will bring enormous financial losses to customer. How to carry on the valid identity to the customer becomes the focus in current financial circle. Traditional ATM systems authenticate generally by using the credit card and the password, the method has some defects. Using credit card and password cannot verify the client's identity

exactly. In recent years, the algorithm that the fingerprint recognition continuously updated, which has offered new verification means for us, the original password authentication method combined with the biometric identification technology verify the clients' identity better and achieve the purpose that use of ATM machines improve the safety effectively.

2. LITERATURE SURVEY

EXISTING SYSTEM

We are using ATM's in our country for all our banking activities. An automated teller machine (ATM) is an electronic telecommunications device that enables customers of financial institutions to perform financial transactions, such as cash withdrawals, deposits, transfer funds, or obtaining account information, at any time and without the need for direct interaction with bank staff. On most modern ATMs, customers are identified by inserting a plastic ATM card (or some other acceptable payment card) into the ATM, with authentication being by the customer entering a personal identification number (PIN), which must match the PIN stored in the chip on the card (if the card is so equipped), or in the issuing financial institution's database. Using an ATM, customers can access their bank deposit or credit accounts in order to make a variety of financial transactions such as cash withdrawals, check balances, or credit mobile phones. ATMs can be used to withdraw cash in a foreign country. If the currency being withdrawn from the ATM is different from that in which the bank account is denominated, the money will be converted at the financial institution's exchange rate.

PROPOSED SYSTEM:

We are using ATM's in our country for all our banking activities. An automated teller machine (ATM) is an electronic telecommunications device that enables customers of financial institutions to perform financial transactions, such as cash withdrawals, deposits, transfer funds or obtaining account information, at any time and without the need for direct interaction with bank staff. In our proposed system we are introducing finger print sensor in which when a user scans their finger, if that user is valid or not. A biometric authentication system seems to be an excellent solution to authentication problems; however biometric authentication has some weaknesses.

Biometrics is a rapidly evolving technology that is being widely used in forensics, such as criminal identification and prison security, and that has the potential to be used in a large range of civilian application areas. Biometrics can be used to prevent unauthorized

access to ATMs, cellular phones, smart cards, desktop PCs, workstations, and computer networks. In automobiles, biometrics can replace keys with keyless entry devices. There are two main objectives of this paper, as follows: - 1. To integrate the fingerprinting in access control for ATM system. 2. To purpose a framework for the ATM system using fingerprint verification.

3. METHODOLOGY

Most biometric technology systems use the same basic principles of operation. First, a person must be registered, or enrolled, on the biometric system.

1. Enrollment:

The process by which a user's biometric data is initially acquired, accessed, processed, and stored in the form of a template for ongoing use in a biometric system is called enrollment. Subsequent verification and identification attempts are conducted against the template(s) generated during enrollment.

2. Presentation:

Presentation is a process by which user provides biometric data to an acquisition device-the hardware used to collect biometric data. Depending on the biometric system, presentation may require looking in the direction of a camera, placing a finger on a platen, or reciting pass phrase.

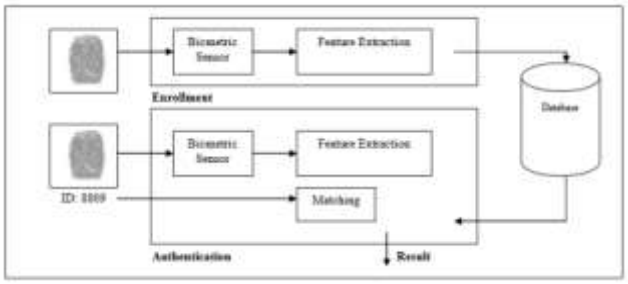
3. Biometric data:

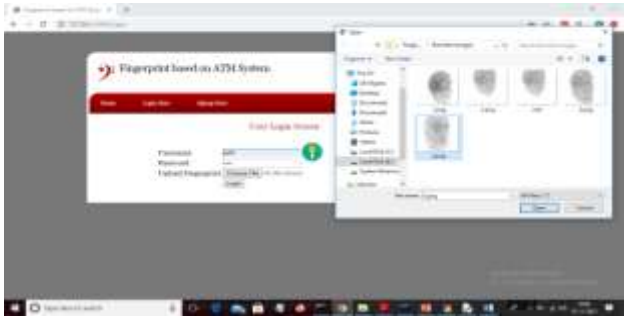
The biometric data users provide in an unprocessed image or recording of a characteristic. The unprocessed data is also referred to as raw biometric data or as a biometric sample. Raw biometric data cannot be used to perform biometric matches. Instead, biometric data provided by the user during enrollment and verification is used to generate biometric templates, and in almost every system is discarded thereafter. Thus Biometric systems do not store biometric data-systems use data for template creation. Enrollment requires the creation of an identifier such as a username or ID. This identifier is normally generated by the user or administrator during entry of personal data. When the user returns to verify, he or she enters the identifier, and then provides biometric data. Once biometric data has been acquired, biometric templates can be created by a process of feature extraction.

4. Feature extraction:

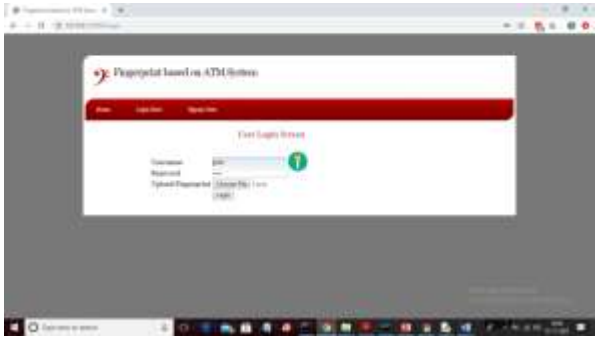
The automated process of locating and encoding distinctive characteristics from biometric data in order to generate a template as called feature extraction. Feature extraction takes place during enrolment and verification-any time a template is created. The feature extraction process includes filtering and optimization of images and data in order to accurately locate features. For example, voice-scan technologies generally filter certain

frequencies and patterns, and finger-scan technologies often thin ridges present in a fingerprint image to the width of a single pixel. Since quality of feature extraction directly affects a system's ability to generate templates, it is extremely important to the performance of a biometric system.





In above screen I am login and selecting wrong finger print as '4.png' and then click on 'Open' button to get below screen



In above screen image loaded and now click on 'Login' button to get below output

In above screen login is failed and now login with correct image

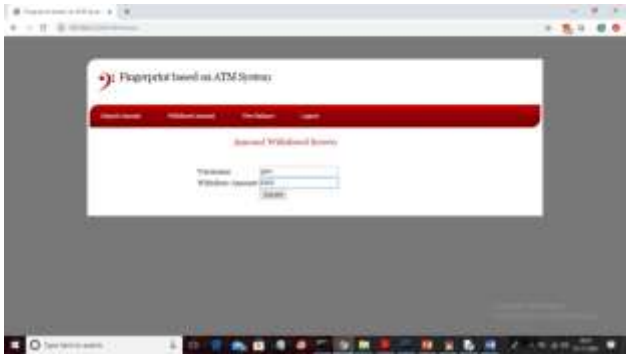
In above screen now i am uploading correct image and press 'Login' button to get below output

In above screen user login is successful and we got deposit and with draw option. Now click on 'Deposit Amount' link to get below screen

In above screen username will display in default and now enter some amount and press 'Submit' button to complete transaction and will get below output

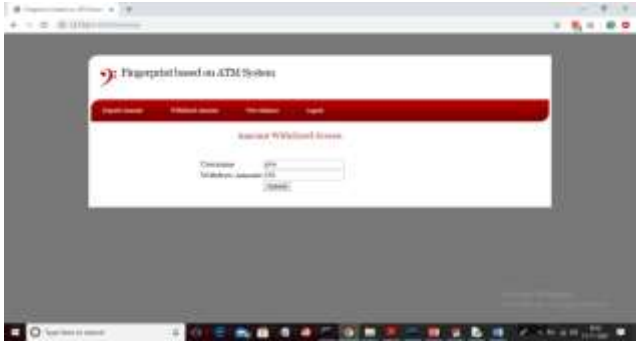
In above screen we can see transaction is successful and now click on 'View Balance' link to view balance

In above screen deposit transaction is displaying and now click on 'Withdrawl Amount' link to get below screen



In above screen I am withdrawing amount larger than available amount to get below screen

In above screen we can see 'Insufficient Fund' and now withdraw another amount



In above screen 500 is withdrawing and press 'Submit' button to get below screen

In above screen withdraw transaction successful and now check balance again

Now in above screen available balance is 500. Similarly you can perform N number of transaction.

CONCLUSION

In today's modern world, autonomous systems play an important role in our day to day life. As the social computerization and automation have drastically increased, it can be seen evidently where the number of ATM centers increases rapidly. Most civilians use ATM's regularly. A good example can be a financial transaction, ease of money exchange etc. So there exists an important factor called security.

The security features were enhanced largely for the stability and reliability of owner recognition. The whole system was built on the fingerprint technology which makes the system safer, reliable and easy to use. As we know that fingerprint are the most acceptable biometrics all over the world in identifying a person. Some government in the world are still implementing fingerprints technique to identify their citizens and the criminal from the scene of crimes in forensic work.

A lot of criminal's tamper with the ATM terminal and steal customers' card details by illegal means. Once users' bank card is lost and the password is stolen, the users' account is vulnerable to attack. Traditional ATM systems authenticate generally by using a card (credit, debit, or smart) and a password or PIN which no doubt has some defects. The prevailing techniques of user authentication, which involves the use of either passwords and user IDs (identifiers), or identification cards and PINs (personal identification numbers), suffer from several limitations.

REFERANCES

[1] Pranali Ravikant Hatwar and Ravikant B Hatwar, BioSignal based Biometric Practices, International Journal of Creative Research Thoughts, Vol. 1, No. 4, pp. 1-9, 2013.

[2] Edmund Spinella, Biometric Scanning Technologies: Finger, Facial and Retinal Scanning, Available at:https://www.sans.org/readingroom/whitepapers /authenticati on/biometric- scanning technologies-finger-facial-retinal-sca nning-1177.

[3] Gu J, Zhou J, Zhang D.A combination model for orientation field of fingerprints. Pattern Recognition, 2004, 37:543-553.

[4] N. Selvaraj and G. Sekar, A Method to enhance the Safety Level of the ATM banking industry using AES Algorithm, International Journal of Computer Applications, Vol. 3, No. 6, pp. 5-9, 2010.

[5] A. Haldorai and A. Ramu, Security and channel noise management in cognitive radio networks, Computers & Electrical Engineering, vol. 87, p. 106784, Oct. 2020. doi:10.1016/jcompeleceng.2020.106784

[6] A. Haldorai and A. Ramu, Canonical Correlation Analysis Based Hyper Basis Feedforward Neural Network Classification for Urban Sustainability, Neural Processing Letters, Aug. 2020. doi:10.1007/s11063-020-10327-3

[7] J. Yang N. Xiong, A.V. Vasilakos, Z. Fang, D. Park, X. Xu, S. Yoon, S. Xie and Y. Yang A Fingerprint Recognition Scheme supported Assembling Invariant Moments for Cloud Computing Communications, IEEE Systems Journal, Vol. 5, No. 4, pp. 574-583, 2011.

[8] J. Leon G. Sanchez G. Aguilar, L. Toscano, H. Perez and J.M. Ramirez, Fingerprint Verification Applying Invariant Moments, Proceedings of IEEE International Midwest Symposium on Circuits and Systems, pp. 751-757, 2009.

[9] LO Gorman Overview of Fingerprint Verification Technologies, Information Security Technical Report, Vol. 3, No. 1, p. 21-32, 1998.

[10] G.B. Iwalokun O.C. Akinyokun, B.K. Alese and O. Olabode Fingerprint Image Enhancement: Segmentation to Thinning, International Journal of Advanced computing and Applications, Vol. 3, No. 1, pp. 15-24., 2012.

COMPARISON OF MACHINE LEARNING METHODS FOR BREAST CANCER DIAGNOSIS

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ABSTRACT:

In the field of assisted cancer diagnosis, it is expected that the involvement of machine learning in diseases will give doctors a second opinion and help them to make a faster / better determination. There are a huge number of studies in this area using traditional machine learning methods and in other cases, using deep learning for this purpose. This article aims to evaluate the predictive models of machine learning classification regarding the accuracy, objectivity, and reproducible of the diagnosis of malignant neoplasm with fine needle aspiration. Also, we seek to add one more class for testing in this database as recommended in previous studies. We present six different classification methods: Multilayer Perceptron, Decision Tree, Random Forest, Support Vector Machine and Deep Neural Network for evaluation. For this work, we used at University of Wisconsin Hospital database which is composed of thirty values which characterize the properties of the nucleus of the breast mass. As we showed in result sections, DNN classifier has a great performance in accuracy level (92%), indicating better results in relation to traditional models. Random forest 50 and 100 presented the best results for the ROC curve metric, considered an excellent prediction when compared to other previous studies published.

Keywords:ROC, DNN, perceptron, deep learning, decision Tree.

1. INTRODUCTION:

In Brazil, for the biennium 2018-2019, 59,700 new cases of breast cancer are anticipated. Breast cancer accounts for 25.2% of female malignancies and an incidence rate of 43.3 /100,000 women. An estimated in 522,000 deaths a year, breast

cancer is responsible for 14.7% of all deaths. Although it has a higher mortality rate than other malignancies, it has a low fatality because its mortality rate is less than 1/3 of the incidence rate. It is the most surviving cancer type annually, approximately 8.7 million. In developed countries the numbers have stabilized, followed by a drop in the last decade. In underdeveloped countries, detection occurs in more advanced stages, contributing to the treatment-related morbidity rate .The disruptive technology applications in the health area have been focused on studying the potential impact on human society.

Regarded the assisted cancer diagnosis, it is expected that the involvement of machine learning in diagnosis could provide doctors a second opinion and help them to make a faster/ better diagnosis.Recently, Google reached an accuracy level in identifying skin cancers, suggesting that the cancer accessibility diagnosis could potentially be extended for aside from medical clinics. The application employed Deep Learning to train a neural network classifier with one of the Wisconsin breast cancer data sets (diagnosis), using the classifier to predict the mammary mass prediction with 30 real numerical values that characterize the cell nucleus properties of mammary mass. Although many studies have been studied breast cancer prediction/classification, we propose a study using a specific algorithms group, containing a random forest split for diversified analyzes. The focus in this field is to apply classification techniques and perform classification/prediction directly from the digital image. In our experiment, we showed the classification of breast cancer with numerical data calculated from the digitized image of a fine needle aspirate (FNA) of a mammary mass. This study aims to evaluate the predictive models of machine learning classification regarding accuracy, objectivity, and reproducibility of the malignant neoplasm diagnosis with fine needle aspiration. An experiment was performed with a data set of 569 women diagnosed with breast cancer or not. Throughout the outcomes, it was possible to state that the DNN‘s model has the best results among the other techniques, having a mean accuracy of 92%, while Random Forest collections presenting a ROC curve coefficient of 94%. The primary contribution provided an overview of machine learning models, looking for their outcomes when tested with a breast cancer data set. We selected models previously used in other studies, applying a different

workflow in training data phase. Moreover, we add a Deep Neural Network method, which isn't tested yet for this data set. Some studies have applied this approach in other image datasets, being proved their utility in this field. In our context, we aim to show the network results were evaluated by standard metrics of machine learning and discuss their application when compared to other methods. The comparison of these techniques, adding deep neural networks was expected from other studies in this area. Cancer is the second reason of human death all over the world and accounts for roughly 9.6 million deaths in 2018. Globally, for 1 human death in 6 can be said that is caused by cancer. Almost 70 percent of the deaths from cancer disease happen in countries that have low and middle income. The most common cancer type among women are breast, lung and colorectal, which totally symbolize half of the all cancer cases. Also, breast cancer is responsible for the thirty percent of all new cancer diagnoses in women. Machine learning (ML) methods ensure analyzing the data and extracting key characteristics of relationships and information from dataset. Also, it creates a computational model for best description of the data. Especially, according to in researches about cancer disease, it can be said that ML techniques can be handled on early detection and prognosis of cancer. Asri et al. have compared some machine learning algorithms for the risk prediction and diagnosis of breast cancer. Support Vector Machine (SVM), k-Nearest Neighbors (kNN), Naive Bayes (NB) and Decision Tree (C4.5) have been applied Wisconsin Breast Cancer (Original) dataset. SVM classification method has been given the highest accuracy value (97.13 %) with least error rate when the experimental results were compared.

2. LITERATURE SURVEY:

1) Detecting Cancer Metastases On Gigapixel Pathology Images

AUTHORS: Y. Liu, K. Gadepalli, M. Norouzi, G. E. Dahl, T. Kohlberger, A. Boyko, S. Venugopalan, A. Timofeev, P. Q. Nelson, G. S. Corrado

Each year, the treatment decisions for more than 230,000 breast cancer patients in the U.S. hinge on whether the cancer has metastasized away from the breast. Metastasis detection is currently performed by pathologists reviewing large expanses of biological tissues. This process is labor intensive and error-prone. We present a framework to automatically detect and

localize tumors as small as 100 x 100 pixels in gigapixel microscopy images sized 100,000 x 100,000 pixels. Our method leverages a convolutional neural network (CNN) architecture and obtains state-of-the-art results on the Camelyon16 dataset in the challenging lesion-level tumor detection task. At 8 false positives per image, we detect 92.4% of the tumors, relative to 82.7% by the previous best automated approach. For comparison, a human pathologist attempting exhaustive search achieved 73.2% sensitivity. We achieve image-level AUC scores above 97% on both the Camelyon16 test set and an independent set of 110 slides. In addition, we discover that two slides in the Camelyon16 training set were erroneously labeled normal. Our approach could considerably reduce false negative rates in metastasis detection.

2) Detection of mass regions in mammograms by bilateral analysis adapted to breast density using similarity indexes and convolutional neural networks

AUTHORS: B. Diniz

The processing of medical image is an important tool to assist in minimizing the degree of uncertainty of the specialist, while providing specialists with an additional source of detect and diagnosis information. Breast cancer is the most common type of cancer that affects the female population around the world. It is also the most deadly type of cancer among women. It is the second most common type of cancer among all others. The most common examination to diagnose breast cancer early is mammography. In the last decades, computational techniques have been developed with the purpose of automatically detecting structures that maybe associated with tumors in mammography examination. This work presents a computational methodology to automatically detection of mass regions in mammography by using a convolutional neural network. The materials used in this work is the DDSM database. The method proposed consists of two phases: training phase and test phase. The training phase has 2 main steps: (1) create a model to classify breast tissue into dense and non-dense (2) create a model to classify regions of breast into mass and non-mass. The test phase has 7 step: (1) preprocessing; (2) registration; (3) segmentation; (4) first reduction of false positives; (5) preprocessing of regions segmented; (6) density tissue classification (7) second reduction of false positives where regions will be classified into mass and non-mass.

The proposed method achieved 95.6% of accuracy in classify non-dense breasts tissue and 97,72% accuracy in classify dense breasts. To detect regions of mass in non-dense breast, the method achieved a sensitivity value of 91.5%, and specificity value of 90.7%, with 91% accuracy. To detect regions in dense breasts, our method achieved 90.4% of sensitivity and 96.4% of specificity, with accuracy of 94.8%.

3) Is mass classification in mammograms a solved problem? - a critical review over the last 20 years

AUTHORS: R. W. D. Pedro, A. Machado-Lima, and F. L. Nunes

Breast cancer is one of the most common and deadliest cancers that affect mainly women worldwide, and mammography examination is one of the main tools to help early detection. Several papers have been published in the last decades reporting on techniques to automatically recognize breast cancer by analyzing mammograms. These techniques were used to create computer systems to help physicians and radiologists obtain a more precise diagnosis. The objective of this paper is to present an overview regarding the use of machine learning and pattern recognition techniques to discriminate masses in digitized mammograms. The main differences we found in the literature between the present paper and the other reviews are: 1) we used a systematic review method to create this survey; 2) we focused on mass classification problems; 3) the broad scope and spectrum used to investigate this theme, as 129 papers were analyzed to find out whether mass classification in mammograms is a problem solved. In order to achieve this objective, we performed a systematic review process to analyze papers found in the most important digital libraries in the area. We noticed that the three most common techniques used to classify mammographic masses are artificial neural network, support vector machine and k-nearest neighbors. Furthermore, we noticed that mass shape and texture are the most used features in classification, although some papers presented the usage of features provided by specialists, such as BI-RADS descriptors. Moreover, several feature selection techniques were used to reduce the complexity of the classifiers or to increase their accuracies. Additionally, the survey conducted points out some still unexplored research opportunities in this area, for example, we identified that some techniques such as random forest and logistic regression are little explored, while others, such as

grammars or syntactic approaches, are not being used to perform this task.

Algorithm: Yolo, Full Resolution Convolutional Network (FrCN)

3. EXISTING SYSTEM

In Existing system the mammography mass detection was designed to increase the performance of specialists by serving as double-reading systems and contributing to the reduction of the number of false-positive or false-negative. There is numerous mass segmentation methods in mammograms, a summary of the most relevant methods are selected from dataset, the evaluation metrics presented are the most frequently used in the literature. However, it is considered an unresolved problem, mainly due to the small number of images used in the studies, mass variability and computational limitations.

DISADVANTAGES OF EXISTING SYSTEM:

- To obtaining a consistent dataset and labeled by specialists in the medical field is one of the main challenges in the development of a CAD(Computer-aided detection)
- The amount of images provided by the bases is still insufficient for the generalization of the problems, due to the variability and size of the masses

4. PROPOSED SYSTEM:

A deep belief network was used for the detection of breast cancer using a technique of back-propagation supervised path using the Wisconsin Breast Cancer Dataset (WBCD). This approach offers 99% accuracy in the classification task. Compositions using deep learning neural network model and SVDD, a variant of the support vector machine, show experimental results to learn multi-class data without severe over-fitting problems. The random Forest model also presents great results with our implementations. We tested with other models like Decision Tree, Support Vector Machine, Neural Network, and Multi-Layer Perceptron. In this study were used data sets combined and splitting for testing, as well as accuracy indicator as a measure for assessing the results.

ADVANTAGES OF PROPOSED SYSTEM:

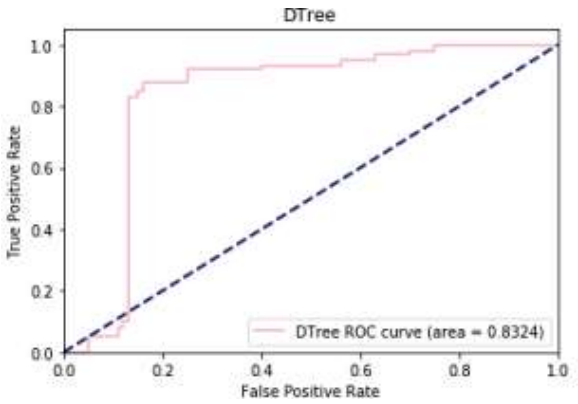
- Identifying the use of data-enhancement and transfer learning techniques that indicate an improvement in the performance of deep learning models.

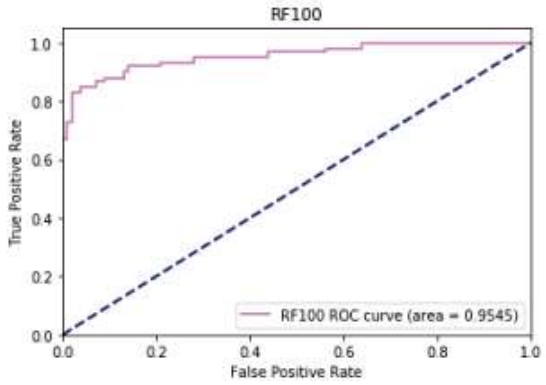
- One of the main advantages of using deep networks techniques when compared to manual resource extraction techniques is the ability to learn a set of high-level attributes and provide high accuracy even in complex problems

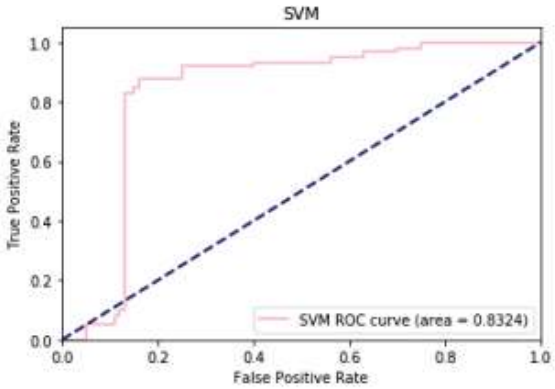
Algorithm: Multi-Layer Perceptron, Decision Tree, Random Forest, Support Vector Machine, Deep Neural Network.

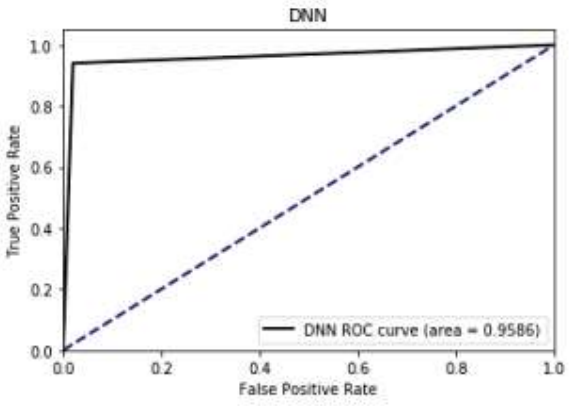
4. RESULTS EXPLANATION

Towards the analysis of our algorithm, we used Jupyter Notebook, python modules (pandas, matplotlib, bumpy) and a scikit-learn framework to process ML algorithms. The following evaluated methods were: Multilayer Perceptron, Decision Tree, Random Forest, Support Vector and Deep Neural network. We divided Random Forest into two sizes: 50 and 100 Trees, aiming to test the different size of trees to verify if their accuracy prediction would be different. We start our experiment splitting our base for training and testing, separating training set in 70 % (398 randomized records) and 30% for test. In this step, we apply one more process for the testing set, splitting into two parts, 50/50. The main idea was to verify in two stages if we obtained a significant difference among the groups. Still, we seek to reduce the chance of over fitting. We need to highlight that DNN model not participated in this split, to verify if without this process the algorithm could present a behavior much different from others. The mean and log loss coefficient of the two stages test approach was shown in 1 and 2.









5. CONCLUSION:

Our study presented a set of classification models, trying to find the best model to classify Breast Cancer according to our data set (WDBC). For this proposal, we selected five different techniques of machine learning, which were considered in other studies with similar proposals. Random Forest was divided between two models: 50 and 100 trees collections. Also, we add Deep Neural Network to visualize their performance in comparison to other classifier methods. Which model has the highest accuracy, objectivity, and reproducibility? It is not so easy to see if one algorithm is better than another only by looking at the error - rate and accuracy values, since there is no classification algorithm for all the challenges to be overcome. It is important to understand the power and limitations of different classifiers, and there is a scale for the challenge/community to use it in the best possible way in order to compare the models in question. A good review of algorithm comparison can be found in. Deep Neural Network had a good performance in this study, although their reach better results in studies involving images. Breast Cancer has provided many studies in recent years, through different approaches as computing vision, classification, and prediction. As future work, we considered an improvement in predictions, testing approaches in databases containing images.

FURTHER ENHANCEMENT

Furthermore, we use a group of metrics to evaluate all results. In this sense, we gave special attention to accuracy and ROC curve measures, proposing a comparison and discussion between these metrics. The outcomes obtained from experiments have been analyzed across, data tables and charts. Regarding our results, Random forest models and Neural Network models presented the best results for the accuracy and the ROC curve. Other models such as Decision Trees and Support Vector produced lower results.

REFERENCES:

[1] M. Da Saúde, "Incidência de câncer no brasil - estimativa 2018," http://www1.inca.gov.br/estimativa/2018/sintese-de-resultados comentarios.asp, p. 130, 2018. [Online]. Available: {http://www1. inca.gov.br/estimativa/2018/sintese-de-resultados-comentarios.asp}

[2] J. Hwang and C. M. Christensen, "Disruptive innovation in health care delivery: a framework for business-model innovation," Health Affairs, vol. 27, no. 5, pp. 1329–1335, 2008.

[3] H. Asri, H. Mousannif, H. Al Moatassime, and T. Noel, "Using machine learning algorithms for breast cancer risk prediction and diagnosis," Procedia Computer Science, vol. 83, pp. 1064–1069, 2016.

[4] Y. Liu, K. Gadepalli, M. Norouzi, G. E. Dahl, T. Kohlberger, A. Boyko, S. Venugopalan, A. Timofeev, P. Q. Nelson, G. S. Corrado et al., "Detecting cancer metastases on gigapixel pathology images," arXiv preprint arXiv:1703.02442, 2017.

[5] E. Aliˇckovi´c and A. Subasi, "Breast cancer diagnosis using ga feature selection and rotation forest," Neural Computing and Applications, vol. 28, no. 4, pp. 753–763, 2017.

[6] H. Wang, B. Zheng, S. W. Yoon, and H. S. Ko, "A support vector machine-based ensemble algorithm for breast cancer diagnosis," European Journal of Operational Research, vol. 267, no. 2, pp. 687–699, 2018. [Online]. Available: https://doi.org/10.1016/j.ejor.2017.12.001

[7] Y.-Q. Liu, C. Wang, and L. Zhang, "Decision tree based predictive models for breast cancer survivability on imbalanced data," pp. 1–4, 2009.

[8] B. Diniz et al., "Detection of mass regions in mammograms by bilateral analysis adapted to breast density using similarity indexes and convolutional neural networks," Computer Methods and Programs in Biomedicine, vol. 156, pp. 191–207, mar 2018.

[9] S. Sharma and P. Khanna, "Computer-aided diagnosis of malignant mammograms using zernike moments and svm," Journal of Digital Imaging, vol. 28, no. 1, pp. 77–90, 2015.

[10] R. W. D. Pedro, A. Machado-Lima, and F. L. Nunes, "Is mass classification in mammograms a solved problem? - a critical review over the last 20 years," Expert Systems with Applications, vol. 119, pp. 90 – 103, 2019.

CRIME DATA ANALYSIS AND PREDICTION USING DECISION TREE

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ABSTRACT:

The criminal cases in India are increasing rapidly due to which number of cases pending are also piling up.This continuous increase in the criminal cases is proving to be difficult to be classified and to be solved.Recognizing the criminal activity patterns of a place is important in order to prevent it from happening. The crime solving agencies can do a better work if they have a good idea of the pattern of criminal activities that are happening in a particular area. This can be done by using machine learning by employing different algorithms to find the patterns of the criminal activities in a particular area.

Keywords: Data analysis, data mining, ML .

1. INTRODUCTION:

This paper uses crime data set and predicts the types of crimes in a particular area which helps in speeding up the classification of criminal cases and proceed accordingly. Data pre-processing is as important as final prediction, this paper used feature selection, removing null values and label encoding to clean and nourish the data. This research gives an efficient machine leaning model for predicting the next criminal case. Various Machine learning models such as Logistic Regression, Decision Tree Classification, and Random Forest Classification were used to find the most efficient model to predict the type of crime at a particular

location.This paper discusses the about existing system which uses K-nearest neighbour to predict next type of crime at a particular location, and also shows how the proposed system is better than the present existing system. This paper compares many machine learning models among themselves to find most efficient machine learning to tackle this problem.

At present, the criminal cases that are pending in India are rapidly increasing with the number of crimes. committed are increasing. To solve a case based upon a particular data there should be a thorough. investigation and analysis that is to be done internally With the amount of crime data that is present.in India currently the analysis and decision making of these criminal cases is too difficult for the officials.Identifying this a major problem this paper concentrates on creating a solution for the decision making of crime that is committed.

2. RELATED STUDY:

It is only within the last few decades that the technology made spatial data mining a practical solution for wide audiences of Law enforcement officials which is affordable and available. Since the availability of criminal data or records is limited we are collecting crime data from various sources like web sites, news sites, blogs, social media, RSS feeds etc. This huge data is used as a record for creating a crime record database. So the main challenge in front of us is developing a better, efficient crime pattern detection tool to identify crime patterns effectively. The main challenges we are facing are: • Increase in crime information that has to be stored and analyzed. • Analysis of data is difficult since data is incomplete and inconsistent. • Limitation in getting crime data records from Law Enforcement department. • Accuracy of the program depends on accuracy of the

training set. Finding the patterns and trends in crime is a challenging factor. To identify a pattern, crime analysts takes a lot of time, scanning through data to find whether a particular crime fits into a known pattern. If it does not fit into an existing pattern then the data must be classified as a new pattern. After detecting a pattern, it can be used to predict, anticipate and prevent crime. Before this clustering algorithms have been used for crime analysis. For instance, one site it is revealed that suspect has black hair and from next site/witness it is revealed that suspect is youth and from third one reveals that the offender has tattoo on his left arm etc. By describing the offender details it gives a complete picture from different crime incidents. Today most of it is manually done with the help of multiple reports that the detectives usually get from the computer data analysts and their own crime logs. The reason for choosing this method is that we have only data about the known crimes we will get the crime pattern for a particular place. Therefore, classification technique that will rely on the existing and known solved crimes, will not give good predictive quality for future crimes. Also nature of crimes change over time, so in order to be able to detect newer and unknown patterns in future, clustering techniques work better.

3. PROPOSED METHODOLOGY WITH RESULTS:

In data collection step we are collecting data from different web sites like news sites, blogs, social media, RSS feeds etc. The collected data is stored into database for further process. Since the collected data is unstructured data we use Mongo DB. Crime data is an unstructured data since the no of field, content, and size of the document can differ from one document to another the better option is to have a schema less database. Also the absence of joins reduces the

complexity. Other benefits of using an unstructured database is that:

- Large volumes of structured, semi-structured, and unstructured data.

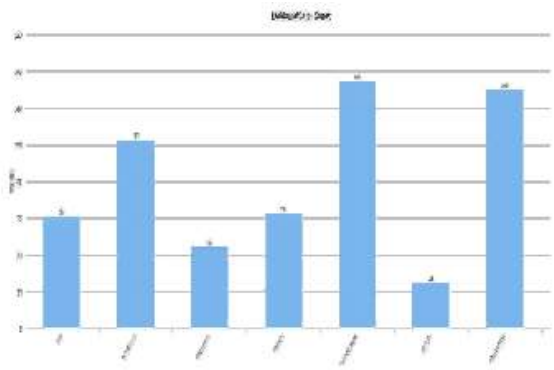
- Object-oriented programming that is easy to use and flexible. The advantage of NoSQL database over SQL database is that it allows insertion of data without a predefined schema. Unlike SQL database it not need to know what we are storing in advance, specify its size etc.

The proposed system is made on the basis of the research work that is done by going through various such documentations. Nearly all of the crimes are predicting based on the location and the types of crimes that are occurring in those areas.On surveying previous works, Linear Regression, Decision Tree and Random Forest tend to give good accuracy so these models are used in this paper to predict crimes. The dataset used in this paper is from data.world.com. The data set contains different types of crimes that being committed in India according to the state and year respectively.

K-Nearest Neighbor:

This is one the simplest model, its purpose is to use a database in which the data points are separated into several classes to predict the classification of a new sample point.

Using features Day, Date, Year of the crime using knn it is found to be 40% accuracy. Adding extra features and trying to improve accuracy is still under construction.



In addition to this a new concept called Criminal profiling which helps

the crime investigators to record the characteristics of criminals. It is a very accurate tool for profiling the characteristics or details of offenders is a behavioural and investigative tool that is intended to help investigators to accurately predict and profile the characteristics of unknown criminal subjects or offenders. The main goal of doing criminal profiling is that:

- to provide crime investigators with a social and psychological assessment of the offender;

- to evaluate belongings found in the possession of the offender. For doing this we have to analyse the criminal backgrounds and criminal records for collecting the maximum criminal data. So the maximum details of each criminals is collected from criminal records.

5. CONCLUSION:

In this paper we have tested the accuracy of classification and prediction based on different test sets. Classification is done based on the Bayes theorem which showed more than 90% accuracy. Using this algorithm we trained numerous news articles and build a model. For testing we are inputting some test data into the model which shows better results. Our system takes factors/attributes of a place and Apriori algorithm gives the frequent patterns of that place. The pattern is used for building a model for decision tree. Corresponding to each place we build a model by training on these frequent patterns. Crime patterns cannot be static since patterns change over time. By training means we are teaching the system based on some particular inputs. So the system automatically learns the changing patterns in crime by examining the crime patterns. Also the crime factors change over time. By sifting through the crime data we have to identify new factors that lead to crime. Since we are considering only some limited factors full accuracy cannot be achieved. For

getting better results in prediction we have to find more crime attributes of places instead of fixing certain attributes. Till now we trained our system using certain attributes but we are planning to include more factors to improve accuracy.

REFERENCES:

[1] Malathi. A and Dr. S. Santhosh Baboo. Article:an enhanced algorithm to predict a future crime using data mining. International Journal of Computer Applications, 21(1):1–6, May 2011. Published by Foundation of Computer Science.

[2] Eibe Frank and Remco R. Bouckaert. Naive bayes for text classification with unbalanced classes. In Proceedings of the 10th European Conference on Principle and Practice of Knowledge Discovery in Databases, PKDD'06, pages 503–510, Berlin, Heidelberg, 2006. Springer-Verlag.

[3] Ralf Hartmut Güting. Graphdb: Modeling and querying graphs in databases. In Proceedings of the 20th International Conference on Very Large Data Bases, VLDB '94, pages 297–308, San Francisco, CA, USA, 1994. Morgan Kaufmann Publishers Inc

[4] Lior Rokach and Oded Maimon. Decision trees. In Oded Maimon and Lior Rokach, editors, The Data Mining and Knowledge Discovery Handbook, pages 165–192. Springer, 2005.

[5] Tong Wang, Cynthia Rudin, Daniel Wagner, and Rich Sevieri. Detecting patterns of crime with series finder. In Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECMLPKDD 2013), 2013.

[6] Li Zhang, Yue Pan, and Tong Zhang. Focused named entity recognition using machine learning. In Proceedings of the 27th Annual International ACM SIGIR Conference on Research and Development in Information Retrieval, SIGIR '04,

pages 281–288, New York, NY, USA, 2004. ACM.

[7] http://www.cs.sunysb.edu/~cse634/lecture_notes/07apriori.pdf. Last accessed:12-April-2014, 10:00 AM

[8] http://www-users.cs.umn.edu/~kumar/dmbook/ch4.pdf. Last accessed:14-April-2014, 1:00 PM.

[9] Ned Horning . Introduction to Decision trees and Random Forests, American Museum of Natural History's Center for Biodiversity and Conservation.

CURRENCY RECOGNITION SYSTEM USING IMAGE PROCESSING

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ABSTRACT:

In this paper, we proposed an automatic currency recognition system using digital image processing methodology. The following project mainly focuses on the recognition of currency by its image or photograph. It will help users to recognize details about currency like Currency Value, Currency Name, the value in INR, EURO and US Dollar. It works using the main characteristics of currency notes such as size colour or printed text on it and also depends on differ in currency notes within the same country. We have considered INDIAN Rupee and US Dollar, the most used currencies in our domain with their denominations. This system works accurately and also able to quickly identify the currency notes.

Keywords:Password, graphical, high security.

1. INTRODUCTION:

According to the UN charter there are around 195 countries around the globe. In which 193 countries are members of the UN and two are observing states. According to The U.N., worldwide there are 180 currencies. All these currencies are different in characteristics such as size, colour and texture. In the era of rapidly growing levels of trade between countries and also tourism all over the world, it becomes necessary to recognize each currency note correctly. Now a days people travel to different countries, they use their native country currency in paying bills or buying stuffs and because most of the local people are not familiar with the currency other than their own country currency and also not familiar with the exchange rate of that currency in their own currency, it becomes necessary to develop an automated system that helps in

recognition notes easily, faster with efficiency.

The proposed system is based on image processing and makes the process robust and automatic.

We used INR and USD as an example to illustrate the technique. This system is based on our knowledge about computer science technologies like Digital Image Processing, python and also a small step to implement in a system that is most important for industrial development.

We used INR and USD as an example to illustrate the technique. This system is based on our knowledge about computer science technologies like Digital Image Processing, python and also a small step to implement in a system that is most important for industrial development.

The block diagram as in Fig. 1 shows the used methods in the system to obtain the actual output same as the expected output. First of all input a currency note image, which needs to be checked. Then system performs basic image processing techniques on input image and refined to convert it into a usable input for matching with present image in dataset. The system extracts the information from image based on features such as colour and texture. With the help of these features the system determines currency name and denomination of the currency note. After this the exchange rate of currency will be extracted from internet with the help of online exchange rate api url. At the end output displayed on the screen.

Literature survey:

Digital Image Processing, 4th Edition

The 4th Edition, which celebrates the book's 40th anniversary, is based on an extensive survey of faculty, students, and independent readers in 150 institutions from 30 countries. Their feedback led to expanded or new coverage of topics such as deep learning and deep neural networks, including convolutional neural nets, the scale-invariant feature transform (SIFT), maximally-stable extremal regions (MSERs), graph cuts, k-means clustering and superpixels, active contours (snakes and level sets), and exact histogram matching. Major improvements were

made in reorganizing the material on image transforms into a more cohesive presentation, and in the discussion of spatial kernels and spatial filtering. Major revisions and additions were made to examples and homework exercises throughout the book. For the first time, we added MATLAB projects at the end of every chapter, and compiled support packages for students and faculty containing, solutions, image databases, and sample code.

Identification of Paper Currency Techniques: A Survey

Paper currency identification is an image processing technique i.e. worn to recognize currency of different countries. The paper currencies of different countries are possibly interweaved collectively consequently rises ever more. It is a challenge for standard currency recognition systems. However, the main focus of most of the standard currency recognition systems and machines is on recognizing forged currencies. Hence there is very vital role of currency identification system and it is essential that the identification system should be very accurate. A thriving approach for paper currency identification depends upon preprocessing, feature extraction and classification of that currency image. In this paper, we have gone through different literature which describes different techniques of paper currency recognition. Finally we have concluded that if we apply some efficient pre-processing and feature extraction technique than we can improve the accuracy of identification system.

Recognition system for real time paper currency

Money number recognition refers to the money of the currency, the currency and authenticity recognition. Money number recognition system is the kernel module of self-service system, and the major applied range is cash-related equipments. In this paper we design a kind of money number recognition system. The quick positioning

of money number is achieved based on gray value accumulation. The edge line of money number area is detected using the least square method. Using geometrical rotation method and gray adjacent interpolation method to realize the number of tilt correction. Based on the character structure characteristic and the imaginary line and character of the point of intersection features, formation recognition judgment tree, realized the character recognition. The simulation experiment indicates that this algorithm has a high recognition accuracy under the condition of rejection.

Extraction of serial number on bank notes

The study of RMB (renminbi bank note, the paper currency used in China) serial number recognition draws more and more attention in recent years, for reducing financial crime, improving financial market stability and social security. The accuracy of RMB recognition relies heavily on the extraction, which is a challenging problem due to background variations and uneven illumination. In this paper, we present a new system that extracts the RMB characters directly from scanned RMB images. First, two different techniques, namely skew correction and orientation identification are used to detect the region which contains RMB serial number. Then the detected text region is binarized by a combined thresholding technique. After that, a local contrast average method is introduced to extract the RMB characters from the binarization result. The experiments demonstrate that the proposed binarization method outperforms other well-known methods. For character extraction, we report an overlap-recall rate of 79.68% and an overlap-precision rate of 98.10% respectively.

2. EXICITING SYSTEM:

According to the UN charter there are around 195 countries around the globe. In which 193 countries are members of the UN and two are observing states. According to The U.N., worldwide there are 180 currencies. All these currencies

are different in characteristics such as size, colour and texture. In the era of rapidly growing levels of trade between countries and also tourism all over the world, it becomes necessary to recognize each currency note correctly. Now a days people travel to different countries, they use their native country currency in paying bills or buying stuffs and because most of the local people are not familiar with the currency other than their own country currency and also not familiar with the exchange rate of that currency in their own currency, it becomes necessary to develop an automated system that helps in recognition notes easily, faster with efficiency.

PROPOSED SYSTEM:

The proposed system is based on image processing and makes the process robust and automatic.

We used INR and USD as an example to illustrate the technique. This system is based on our knowledge about computer science technologies like Digital Image Processing, python and also a small step to implement in a system that is most important for industrial development. We had considered INDIAN Rupee and US Dollar for this project. Project can expand for more currencies inclusion according to use.

CNN Algorithm

1) Feature Extraction: CNN compose of multiple layers and first layer define for feature extraction and this features will be extracted from given input image dataset or any other multidimensional dataset.

2) Feature Selection: Using this layer features will be selected by applying a layer called pooling or max polling.

3) Activation module: using this module RELU will be applied on input features to remove out unimportant features and hold only relevant important features

4) Flatten: This layer will be define to convert multidimensional input features into single dimensional input array

5) Dense: This layer can be used to connect one layer to other layer to receive input features from previous layer to new layer to further filter input features in next layer to get most important features from dataset to have best prediction result.

3. METHODOLOGY

The proposed system was implemented using Visual Basic .net 2005 (VB.net). The implementation has three main classes:

• Login Info: Contains username, graphical password, and related methods.

• Graphical Password: Contains graphical password information and related methods.

• Sel Reg: Contains fields about selected regions (POIs).

CONCLUSION

In conclusion, we have designed a system that accurately identifies both the country of origin and the denomination of a given banknote. Our system currently supports twenty of the most common currencies, but can easily be extended to more countries based on the method we have previously described. When compared with the crude algorithm of pixel by pixel comparison, our algorithm is considerably more accurate, and takes less time. We have thus learned that our proposed algorithm is able to identify currency and denomination in an average of 5.3 seconds, which is a considerable improvement over the crude algorithm. However, our proposed system only considers a limited number of currencies. There are 180+ currencies that can be

included in the system, and we have chosen to only do for 20 of the most common ones. Also, the system should be effective in identifying notes that are mutilated. Our system is not effective under this consideration. This can be worked on in the future..

REFERANCES

1. Pearson Book on Digital Image Processing 4th Edition By Gonzalez (2018).

2. Programming and Problem Solving with Python 1st Edition by 'Ashok Namdev Kamthane' and 'Amit Ashok Kamthane' 2017

3. Identification of Paper Currency Techniques: A Survey by S. Sahu and T. Verma International Journal of Science Technology & Engineering (2016)

4. Recognition system for real time paper currency. IEEE 2012.

5. Extraction of serial number on bank notes. IEEE.

6. Digital Image Processing And Analysis: Human And Computer Vision Applications With Cviptools, 2nd Edition by Scott E Umbaugh, T and F India.

7. An intelligent system for paper currency recognition - robust features Journal of Intelligent & Fuzzy Systems - A. Sargano, M. Sarfrazb, and N. Haq, 2014.

8. Paper Currency Recognition - Journal of Advanced Computer Science and Technology Research , 'Althafiri E, Sarfraz M', 'Alfarras M. Bahraini'.

9. Study of Printing Identification Based on Multispectrum Imaging Analysis, Proceedings of the International Conference on Computer Science and Software Engineering, By Liu Q, Tang L. p. 229 – 232; 2008.

DETECTION OF FAKE NEWS THROUGH IMPLEMENTATION OF DATA SCIENCE APPLICATION

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ABSTRACT:

In our modern era where the internet is ubiquitous, everyone relies on various online resources for news. Along with the increase in the use of social media platforms like Facebook, Twitter, etc. news spread rapidly among millions of users within a very short span of time. The spread of fake news has far-reaching consequences like the creation of biased opinions to swaying election outcomes for the benefit of certain candidates. Moreover, spammers use appealing news headlines to generate revenue using advertisements via click-baits. In this paper, we aim to perform binary classification of various news articles available online with the help of concepts pertaining to Artificial Intelligence, Natural Language Processing and Machine Learning. We aim to provide the user with the ability to classify the news as fake or real and also check the authenticity of the website publishing the news.

Keywords:Fake news, AI, Facebook, Twitter.

1. INTRODUCTION:

As an increasing amount of our lives is spent interacting online through social media platforms, more and more people tend to hunt out and consume news from social media instead of traditional news organizations.[1] The explanations for this alteration in consumption behaviors are inherent within the nature of those social media platforms: (i) it's often more timely and fewer expensive to consume news on social media compared with traditional journalism , like newspapers or television; and (ii) it's easier to further share, discuss , and discuss the news with friends or other readers on social media. For instance, 62 percent of U.S. adults get news on social media in 2016, while in 2012; only 49 percent reported seeing news on social media [1]. It had been also found that social media now outperforms television because the major news source. Despite the benefits provided by social media, the standard of stories on social media is less than traditional news organizations. However, because it's inexpensive to supply news online and far faster and easier to propagate through social media, large volumes of faux news, i.e., those news articles with intentionally false information, are produced online for a

spread of purposes, like financial and political gain. it had been estimated that over 1 million tweets are associated with fake news “Pizzagate" by the top of the presidential election. Given the prevalence of this new phenomenon, “Fake news" was even named the word of the year by the Macquarie dictionary in 2016 [2]. The extensive spread of faux news can have a significant negative impact on individuals and society. First, fake news can shatter the authenticity equilibrium of the news ecosystem for instance; it's evident that the most popular fake news was even more outspread on Facebook than the most accepted genuine mainstream news during the U.S. 2016 presidential election. Second, fake news intentionally persuades consumers to simply accept biased or false beliefs. Fake news is typically manipulated by propagandists to convey political messages or influence for instance, some report shows that Russia has created fake accounts and social bots to spread false stories. Third, fake news changes the way people interpret and answer real news, for instance, some fake news was just created to trigger people's distrust and make them confused; impeding their abilities to differentiate what's true from what's not. To assist mitigate the negative effects caused by fake news (both to profit the general public and therefore the news ecosystem). It's crucial that we build up methods to automatically detect fake news broadcast on social media.

2. LITERATURE SURVEY:

Mykhailo Granik et. al. in their paper [3] shows a simple approach for fake news detection using naive Bayes classifier. This approach was implemented as a software system and tested against a data set of Facebook news posts. They were collected from three large Facebook pages each from the right and from the left, as well as three large mainstream political news pages (Politico, CNN, ABC News). They achieved classification accuracy of approximately 74%. Classification accuracy for fake news is slightly worse. This may be caused by the skewness of the dataset: only 4.9% of it is fake news. Himank Gupta et. al. [10] gave a framework based on different machine learning approach that deals with various problems including accuracy shortage, time lag (BotMaker) and high processing time to handle thousands of tweets in 1 sec. Firstly, they have collected 400,000 tweets from HSpam14 dataset. Then they further characterize the 150,000 spam tweets and 250,000 non- spam tweets. They also derived some lightweight features along with the Top-30 words that are providing highest information gain from Bag-of-Words model. 4. They were able to achieve an accuracy of 91.65% and surpassed the existing solution by approximately18%. Marco L. Della Vedova et. al. [11] first proposed a novel ML fake news detection method which, by combining news content and social context

features, outperforms existing methods in the literature, increasing its accuracy up to 78.8%. Second, they implemented their method within a Facebook Messenger Chabot and validate it with a real-world application, obtaining a fake news detection accuracy of 81.7%. Their goal was to classify a news item as reliable or fake; they first described the datasets they used for their test, then presented the content-based approach they implemented and the method they proposed to combine it with a social-based approach available in the literature. The resulting dataset is composed of 15,500 posts, coming from 32 pages (14 conspiracy pages, 18 scientific pages), with more than 2, 300, 00 likes by 900,000+ users. 8,923 (57.6%) posts are hoaxes and 6,577 (42.4%) are non-hoaxes. Cody Buntain et. al. [12] develops a method for automating fake news detection on Twitter by learning to predict accuracy assessments in two credibility-focused Twitter datasets: CREDBANK, a crowd sourced dataset of accuracy assessments for events in Twitter, and PHEME, a dataset of potential rumors in Twitter and journalistic assessments of their accuracies. They apply this method to Twitter content sourced from BuzzFeed's fake news dataset. A feature analysis identifies features that are most predictive for crowd sourced and journalistic accuracy assessments, results of which are consistent with prior work. They rely on identifying highly retweeted threads of conversation and use the features of these threads to classify stories, limiting this work's applicability only to the set of popular tweets. Since the majority of tweets are rarely retweeted, this method therefore is only usable on a minority of Twitter conversation threads. In his paper, Shivam B. Parikh et. al. [13] aims to present an insight of characterization of news story in the modern diaspora combined with the differential content types of news story and its impact on readers. Subsequently, we dive into existing fake news detection approaches that are heavily based on text-based analysis, and also describe popular fake news datasets. We conclude the paper by identifying 4 key open research challenges that can guide future research. It is a theoretical Approach which gives Illustrations of fake news detection by analyzing the psychological factors.

3. METHODOLOGY

In this paper, the research process, technical analysis, technical linguistics work, and classifier performance and results are presented. The paper concludes with a discussion of how the current system will evolve into an influence mining system. The fake news stories that are initially seeded over social media platforms share key linguistic characteristics such as excessive use of unsubstantiated hyperbole and non-attributed quoted content. The results of a fake news identification study that documents the

performance of a fake news classifier are presented and discussed in this paper.

Objective:

Fake news has been demonstrated to be problematic in multiple ways. It has been shown to have real influence on public perception and the ability to shape regional and national dialogue . It has harmed businesses and individuals and even resulted in death, when an individual responded to a hoax . It has caused some teenagers to reject the concept of media objectivity and many students can't reliably tell the difference between real and faked articles . It is even thought to have influenced the 2016 United States elections . Fake news can be spread deliberately by humans or indiscriminately by bot armies , with the latter giving a nefarious article significant reach. Not just articles are faked, in many cases fake, mislabeled or deceptive images are also used to maximize impact . Some contend that fake news is a "plague" on society's digital infrastructure . Many are working to combat it. Farajtabar, et al. , for example, has proposed a system based on points, while Haigh, Haigh and Kozakhave suggested the use of "peer-to-peer counter propaganda.

Proposed System:

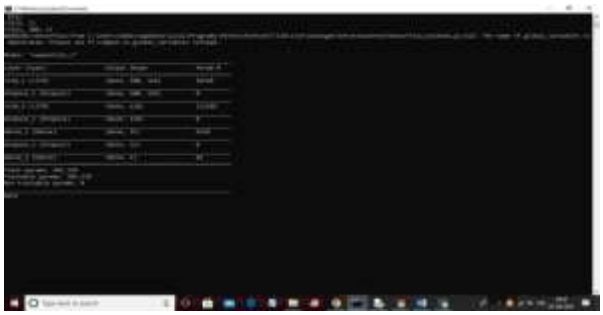
In this paper author is describing concept to detect fake news from social media or document corpus using Natural Language Processing and attribution supervised learning estimator. News documents or articles will be uploaded to application and then by using Natural Language Processing to extract quotes, verbs and name entity recognition (extracting organizations or person names) from documents to compute score, verbs, quotes and name entity also called as attribution. Using supervised learning estimator we will calculate score between sum of verbs, sum of name entity and sum of quotes divided by total sentence length. If score greater than 0 then news will be consider as REAL and if less than 0 then new will be consider as FAKE.

In above screen selecting and uploading 'news.csv' file and then click on 'Open' button to load dataset and to get below screen

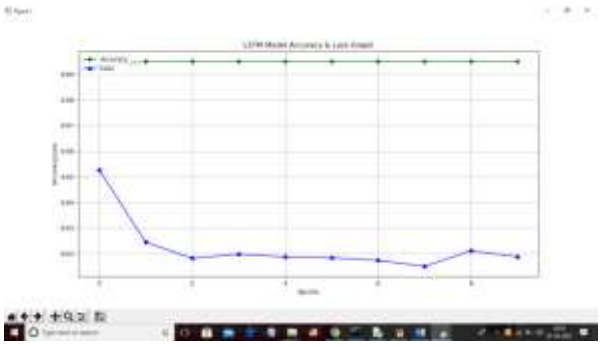
In above screen dataset loaded and then in text area we can see all news text with the class label as 0 or 1 and now click on 'Preprocess Dataset & Apply NGram' button to convert above string data to numeric vector and to get below screen

In above screen all news words put in column header and if that word appear in any row then that rows column will be change with word count and if not appear then 0 will be put in column. In above screen showing some records from total 7612 news records and in bottom lines we can see dataset contains total 7613 records and then application using 80% (6090 news records) for training and then using 20% (1523 news records) for testing and now dataset is ready with numeric record and now click on 'Run LSTM Algorithm' button to train above dataset with LSTM and then build LSTM model and then calculate accuracy and error rate

In above screen LSTM model is generated and we got its prediction accuracy as 69.49% and we can see below console to see LSTM layer details



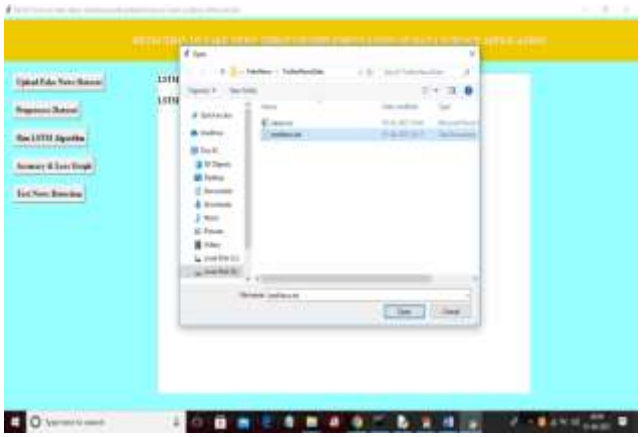
In above screen different LSTM layers are created to filter input data to get efficient features for prediction. Now click on 'Accuracy & Loss Graph' button to get LSTM graph



In above graph x-axis represents epoch/iterations and y-axis represents accuracy and loss value and green line represents accuracy and blue line

represents loss value and at each increasing epoch loss values get decrease and accuracy reached to 70%. Now click on 'Test News Detection' button to upload some test news sentences and then application predict whether that news is genuine or fake. In below test news dataset we can see only TEXT data no class label and LSTM will predict class label for that test news

In above screen in test news we have only one column which contains only news 'TEXT' and after applying above test news we will get prediction result



In above screen selecting and uploading 'testNews.txt' file and then click on 'Open' button to load data and to get below prediction result

In above screen before dashed symbols we have news text and after dashed symbol application predict news as 'FAKE or GENUINE'. After building model when we gave any news text then LSTM will check whether more words belongs to genuine or fake category and whatever category get more matching percentage then application will predict that class label.

CONCLUSION

This paper presented the results of a study that produced a limited fake news detection system. The work presented herein is novel in this topic domain in that it demonstrates the results of a full-spectrum research project that started with qualitative observations and resulted in a working quantitative model. The work presented in this paper is also promising, because it demonstrates a relatively effective level of machine learning classification for large fake news documents with only one extraction feature. Finally, additional research and work to identify

and build additional fake news classification grammars is ongoing and should yield a more refined classification scheme for both fake news and direct quotes.

Future Work

The work presented in this paper is also promising, because it demonstrates a relatively effective level of machine learning classification for large fake news documents with only one extraction feature. Finally, additional research and work to identify and build additional fake news classification grammars is ongoing and should yield a more refined classification scheme for both fake news and direct quotes.

REFERANCES

[1] Kai Shu, Amy Sliva, Suhang Wang, Jiliang Tang, and Huan Liu, “Fake News Detection on Social Media: A Data Mining Perspective” arXiv:1708.01967v3 [cs.SI], 3 Sep 2017

[2] Kai Shu, Amy Sliva, Suhang Wang, Jiliang Tang, and Huan Liu, “Fake News Detection on Social Media: A Data Mining Perspective” arXiv:1708.01967v3 [cs.SI], 3 Sep 2017

[3] M. Granik and V. Mesyura, "Fake news detection using naive Bayes classifier," 2017 IEEE First Ukraine Conference on Electrical and Computer Engineering (UKRCON), Kiev, 2017, pp. 900-903.

[4] Fake news websites. (n.d.) Wikipedia. [Online]. Available: https://en.wikipedia.org/wiki/Fake_news_website . Accessed Feb. 6, 2017

[5] Cade Metz. (2016, Dec. 16). The bittersweet sweepstakes to build an AI that destroys fake news.

[6] Conroy, N., Rubin, V. and Chen, Y. (2015). “Automatic deception detection: Methods for finding fake news” at Proceedings of the Association for Information Science and Technology, 52(1), pp.1-4.

[7] Markines, B., Cattuto, C., & Menczer, F. (2009, April). “Social spam detection”. In Proceedings of the 5th International Workshop on Adversarial Information Retrieval on the Web (pp. 41-48)

[8] Rada Mihalcea , Carlo Strapparava, The lie detector: explorations in the automatic recognition of deceptive language, Proceedings of the ACL-IJCNLP

[9] Kushal Agarwalla, Shubham Nandan, Varun Anil Nair, D. Deva Hema, “Fake News Detection using Machine Learning and Natural Language Processing,” International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-7, Issue-6, March 2019

[10] H. Gupta, M. S. Jamal, S. Madisetty and M. S. Desarkar, "A framework for real-time spam detection in Twitter," 2018 10th International

Conference on Communication Systems & Networks (COMSNETS), Bengaluru, 2018, pp. 380-383

[11] M. L. Della Vedova, E. Tacchini, S. Moret, G. Ballarin, M. DiPierro and L. de Alfaro, "Automatic Online Fake News Detection Combining Content and Social Signals," 2018 22nd Conference of Open Innovations Association (FRUCT), Jyvaskyla, 2018, pp. 272-279.

FARMING MADE EASY USING MACHINE LEARNING

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ABSTRACT:

Agriculture is the primary mainstay of the economy in our country. In recent years because of uncertain trends in climate and other fluctuations in the price trends, the price of the crop has varied to a larger level. Farmers remain oblivious of these uncertainties, which spoils the crops and causes massive loss. They are unaware of the crop type which would benefit them most. Due to their limited knowledge of different crop diseases and their specific remedies, crops get damaged. This system is handy, easy-to-use. It provides accurate results in predicting the price of the crop. This framework utilizes Machine Learning's Decision Tree Regression Algorithm to predict crop price. The attributes considered for prediction are rainfall, wholesale price index, month, and year. Consequently, the system gives an advance forecast to the farmers' which grows the speed of profit to them and consequently the country's economy. This system also incorporates other modules like weather forecast, crop recommendation, fertilizer recommendation, and shop, chat portal, and guide are also implemented.

Keywords: crop, forecast, ML.

1. INTRODUCTION:

India being a rural nation, its economy transcendently relies upon agricultural yield development and unified agroindustry items. It is currently quickly advancing towards a specialized turn of events. India now is rapidly progressing towards technical development. Smart farming is changing the face of agriculture in India. Technology can provide a solution to most challenges farmers face. It can help them predict weather more accurately, decrease waste, boost

output and increase their profit margins. In the status quo, the farmers and the consumers find it difficult in the real world to determine the accurate prices of crops without having prior knowledge of the fluctuating trend prices or weather conditions. Accordingly, innovation will end up being helpful to agriculture. The paper aims to predict crop prices in advance. This work is based on finding proper regional datasets that help us in achieving high accuracy and better performance. Our system, Agro-Genius, is using Machine Learning to build the Price Predicting Model.

In the past few years, a lot of fluctuation in the prices of the crop has been seen. This has increased the rate of crop damage produced each year. The main aim of this prediction system is to ensure that the farmers get a better idea about their yield and deal with the value risk.

Weather is also highly unpredictable these days. It also affects the crop production. The proposed system will also forecast the weather helping the farmer make correct decisions regarding field ploughing, field harvesting etc. Similarly, fertilizers play an important role. Fertilizers load the soil with the required nutrients that the crops eliminate from the soil. Crop yields and production will be fundamentally decreased if fertilizers are not used. That is the reason fertilizers are utilized to enhance the soil's supplement stocks with minerals that can be immediately assimilated and utilized by crops. Our system will provide fertilizer consumption based on different crops and provide a portal to buy the fertilizers and seeds from the user's location. They can even get the exact location along with the address of the fertilizer and seed shop. The provided fertilizers will get more profit to the farmers on the growing system suggested crop. It will also show the best suited crop based on cultivation date and month and location details, thereby maximizing the yield.

It will provide multilingual and region specific guide books for the farmers. Any farmer who is new to this field and who wishes to gain information from his ancestors but having the same methods documented will be highly beneficial. We have also provided maps for the farmers to gain knowledge. Our system will provide two different types of maps for the farmer to gain the knowledge about how the land and where they should start their farming. Irrigation maps show the irrigated-non irrigated area over the country. Agriculture land view map will provide an overview of agricultural land present in various states of India and help farmers to analyze the non Agricultural land which can further be improved. Maps make the farmers easy

to understand they have to just hover on the state they are thinking of starting their farming and they will get the information about that state and they can decide whether they should change the place or should start farming. If the farmers are new in this field it is the best thing for them as the most important thing in farming is to firstly choose the land and place of farming.

Moving in the same direction, our system will incorporate a chat application which helps in information sharing. Often farmers have certain queries which cannot be solved due to their limited knowledge, hence we are building a platform where information can be exchanged. Language can pose as a barrier to the users. Since the majority of non- English speaking farm workers in India are native Hindispeakers, we anticipate that once these resources are developed they might be translated to other languages as well. Hence, to make the website user friendly, we have provided language translation.

Farmers should know about their location, date of cultivation of their crop. Our system is a web application, which is developed based on machine learning concepts. The proposed system applies machine learning and prediction algorithms like Naive Bayers, Decision Trees and K-Nearest Neighbour to identify the most accurate model and then process it. This in turn will help predict the price of the crop.

2. LITERATURE SURVEY

The following papers focused on predicting crop price using Machine Learning and providing results. In April 2019, the exploration targets foreseeing both the cost and benefit of the given harvest before planting. The preparing datasets so acquired give enough bits of knowledge to foresee the suitable cost and request in the business sectors[1]. The authors have predicted the most profitable crops and its expected price during harvesting time according to the location, by predicting different historical raw datasets using different machine learning algorithms. The work shown by Nishiba [2] is the expected utilization of data mining procedures in foreseeing the harvest yield dependent on the input parameters average rainfall and area of the field. The easy-to-use website page created for anticipating crop yield can be utilized by any client by giving the normal precipitation and region of that place. Different Data Mining techniques are applied to different datasets. This paper can also include certain modules [11] which can help farmers to make certain decisions based

on the harvested area or current trends in the market. The system can be extended by visualizing the crop details in a map with details, which will help farmers to view the nearby district cultivation details. Proposed system can be enhanced by providing a graphical visualization of predicted prices for better understanding.

This system is proposed to provide help to the farmers for expecting the best amount for their crops and for predicting the best price for the crops. This also helps the farmers to check previous prices of different commodities. The system can predict crops using [9] Random forest, Polynomial Regression and Decision Tree algorithms. The best crop and its required fertilizers make the farmer more confident about the crop and its yield and also our system will do marketing work [4] by estimating total value of the crop based on current market price. The idea of the system can be extended by adding some extra features to the system like providing a nearby shop location portal for purchasing seeds and fertilizers.

These papers aim at predicting the price and forecast through web application and it runs on efficient machine learning algorithms like using an Autoregressive Integrated Moving Average (ARIMA) model,Traditional ARIMA [6], Support Vector Regression Algorithm[8], and technologies having a general easy to use interface to the clients. The training datasets [7] acquired give sufficient bits of knowledge to foreseeing the appropriate price [10] and request in the markets. The results are displayed as web applications in order that poor farmers can access easily. Models can be improved by integrating this with other departments like horticulture, sericulture, and others towards the agricultural development of our country. Different agriculture departments have various problems in the current time. Incorporating them will not only increase the scope but also help the farmers new to this part of the spectrum. Their work may be expanded by building a framework for suggesting agriculture produce and dispersion for farmers. Utilizing this framework, We ought to get the same accuracy indeed when an information autonomous framework is utilized. Further, can be enhanced by making an android application for the same.

EXICITING SYSTEM:

We have used Python for basic programming in all modules. Flask is used for hosting. Socket Programming is used for a chat application. Chart.js is used for visualizing the maps. JavaScript is used for validation purposes.

For Weather Forecast [12] and fertilizer shop location, we have used APIs. Using the self-made dataset and concept of linear regression in machine learning we have implemented a Crop recommendation model so that a farmer can learn about the best suited crop for a particular region. In Fertilizer Recommendation we have used a dataset for predicting which fertilizer should be used for the disease present on crops. Socket programming is used for farmers interaction using provided chat application [3]. Google API is used for providing a multilingual website for ease to read.

PROPOSED SYSTEM:

Agriculture is the primary mainstay of the economy in our country. In recent years because of uncertain trends in climate and other fluctuations in the price trends, the price of the crop has varied to a larger level. Farmers remain oblivious of these uncertainties, which spoils the crops and causes massive loss. They are unaware of the crop type which would benefit them most. Due to their limited knowledge of different crop diseases and their specific remedies, crops get damaged. This system is handy, easy-to-use. It provides accurate results in predicting the price of the crop. This framework utilizes Machine Learning's Decision Tree Regression Algorithm to predict crop price. The attributes considered for prediction are rainfall, wholesale price index, month, and year. Consequently, the system gives an advance forecast to the farmers' which grows the speed of profit to them and consequently the country's economy. This system also incorporates other modules like weather forecast, crop recommendation, fertilizer recommendation, and shop, chat portal, and guide are also implemented.

3. METHODOLOGY

MODULES:

1) New Farmer Signup:

Using this module farmers can signup with application

2) Farmer Login:

Farmer can login to application by using username and password given at signup time and then farmer can select crop name to get its predicted prices in different market. Farmer can view all schemes details launched from the government

3) Admin Login:

Admin can login to application by using 'admin' as username and password and then can add new schemes details

OPERATION:

In above screen server started and now open browser and enter URL

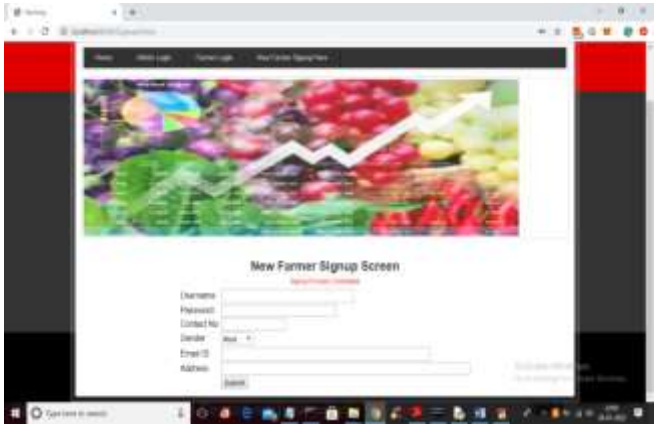
In above screen click on 'Admin Login' link to get below login screen

In above screen admin is login and after login will get below screen

In above screen click on 'Add Government Schemes' link to add new schemes

In above screen farmer is signup and click on 'Submit' button to complete signup process

In above screen admin will ad schemes details with start and end date and then click on 'Submit' button to save schemes details



In above screen signup is completed and now click on 'Farmer Login' link to get below screen

In above screen in red colour text we can see scheme details added and now logout and signup new farmer

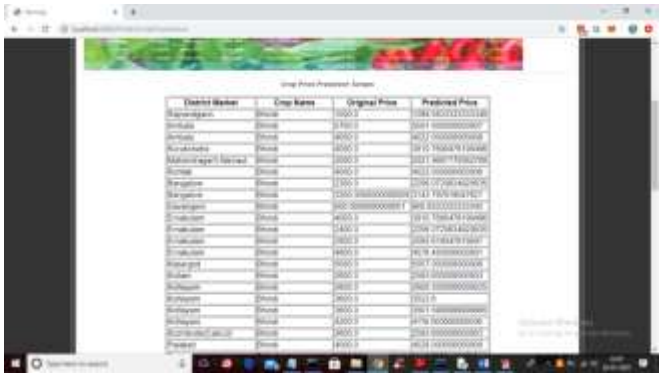
In above screen farmer is login and click on 'Login' button to get below screen

In above screen farmer can click on 'View Schemes' link to get all schemes details

In above screen all schemes details can be viewed by farmer and now click on 'Predict Crop Prices' link to get below screen

In above screen farmer can select desired crop and then click on 'Predict Crop Prices' link to get below prediction

In above graph red line represents Original prices and green line represents predicted prices and by seeing above graph farmer can understand what is current price and what will be future price and now close above graph to view predicted values



In above screen first column represents 'district market name' and second column represents 'Crop Name' and third column represents 'Original Crop Price' and fourth column represents "predicted prices' using Machine learning algorithms and now scroll down above screen to view machine learning algorithms predicted accuracy

In above screen in last 3 lines we can see Random forest, KNN and decision tree prediction accuracy.

Similarly you can select any crop and get prediction prices

Note: some crop contains only 3 or 4 records so prediction may not be correct as to train we need minimum 50 to 100 records. Here bhindi and coriander crop contains more records

CONCLUSION

This project is undertaken using machine learning and evaluates the performance by using KNN, Naive Bayes, and Decision Tree algorithms. In our proposed model among all the three algorithm Decision Tree gives the better yield prediction as compared to other algorithms

As most extreme sorts of harvests will be secured under this system, farmers may become more acquainted with the yield which may never have been developed. The work exhibited the expected utilization of machine learning methods in foreseeing the harvest cost dependent on the given attributes. The created web application is easy to understand and the testing accuracy is over 90%.

REFERANCES

[1] Rachana, Rashmi, Shravani, Shruthi, Seema Kousar, Crop Price Forecasting System Using Supervised Machine Learning Algorithms, International Research Journal of Engineering and Technology (IRJET), Apr 2019

[2] Nishiba Kabeer, Dr.Loganathan.D, Cowsalya.T, Prediction of Crop Yield Using Data Mining, International Journal of Computer Science and Network, June 2019

[3] J. Vijayalakshmi, K. PandiMeena, Agriculture TalkBot Using AI, International Journal of Recent Technology and Engineering (IJRTE), July 2019

[4] Gamage, A., & Kasthurirathna, D. Agro-Genius: Crop Prediction Using Machine Learning, International Journal of Innovative Science and Research Technology, Volume 4, Issue 10, October – 2019

[5] Vohra Aman, Nitin Pandey, and S. K. Khatri. "Decision Making Support System for Prediction of Prices in Agricultural Commodity." 2019 Amity International Conference on Artificial Intelligence (AICAI). IEEE, 2019.

[6] Nguyen, Huy Vuong, et al. "A smart system for short-term price prediction using time series

models." Computers & Electrical Engineering 76 (2019)

[7] Sangeeta, Shruthi G, Design And Implementation Of Crop Yield Prediction Model In Agriculture, International Journal Of Scientific & Technology Research Volume 8, Issue 01, January 2020

[8] Rohith R, Vishnu R, Kishore A, Deeban Chakkarawarthi, Crop Price Prediction and Forecasting System using Supervised Machine Learning Algorithms, International Journal of Advanced Research in Computer and Communication Engineering, March 2020

[9] Naveen Kumar P R, Manikanta K B, Venkatesh B Y, Naveen Kumar R, Amith Mali Patil, Journal of Xi'an University of Architecture & Technology, 2020.

[10] Kumar, Y. Jeevan Nagendra, et al. "Supervised Machine learning Approach for Crop Yield Prediction in the Agriculture Sector." 2020 5th International Conference on Communication and Electronics Systems (ICCES). IEEE, 2020.

[11] Pandit Samuel, B.Sahithi , T.Saheli , D.Ramanika , N.Anil Kumar, Crop Price Prediction System using Machine learning Algorithms, Quest Journals Journal of Software Engineering and Simulation, 2020

A General Evaluation of Dermis Sores Identification using MOR-WAVELET Transforms

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Abstract: Dermis Canker detection is one of the significant image processing approach utilized in finding the Dermis sores, for example, malignancy and other pigmented sores. Because of the trouble and subjectivity of human understanding, mechanized examination of dermoscopy pictures has become a significant exploration territory. One of the most significant strides in dermoscopy picture investigation is the mechanized discovery of sore outskirts. In this paper we propose a novel approach for fringe recognition of sores in dermoscopy pictures. To begin with, the shading input picture is changed over into a dim level picture. At that point, the wavelet coefficients of dark level picture are determined. The wavelet coefficients are adjusted utilizing inclination of each wavelet band and a nonlinear capacity. The upgraded picture is acquired from the opposite wavelet change of altered coefficients. Morphology administrators are utilized to fragment the picture; lastly the injury is distinguished by a mechanized calculation. The outcomes show that the proposed technique has a low rate fringe error in a greater part of Dermis injuries.

Keywords: Discrete Wavelet Transform, Fringe error, Morphology, Dermis Sores, Malignancy

1. Introduction

A crucial difficulty the medical practitioners facing is to identify the frequent cause of deaths due to dermis diseases not identified at early stages. As indicated by the W.H.O, there are around one million dangerous malignancy cases and more than sixty thousands demise instances of harmful malignancy iaround the globe every year [1]. Dermis is the comparatively bigger organ in the human body, which comprises of the 3 principal layers: Dermis, epidermis, and hypodermis. The Dermis has a significant job in the soma securing about external influenced parameters, for example, microscopic organisms, heat changes, and presentation to bright radiation (U.V.R) [2]. U.V.R is one of the well-known grounds that take to dermis malignant growth. These U.V.R beams are sufficiently amazing to arrive at our slough layer in the dermis and harm the D.N.A which drives at last to Dermis disease. The postponement from the hour of harm and the malignant growth can be numerous years.

The expression "Dermis disease" refers to three distinct conditions that are recorded underneath in rising request of mortality:

1. Basal cell carcinoma (or basal cell carcinoma epithelioma)
2. Squamous cell carcinoma (the principal phase of which is called actinic keratosis)
3. Malignancy.

Malignancy is commonly the genuine type of dermis lymphoma since it will spread in general (metastasize) all through the body rapidly.

Dermatologists are confronting urgent issues in confirming the threatening malignancy by utilizing dermoscopy. The determination by utilizing dermis-surface microscopy is not exact and sets aside some effort to give the last finding. Timely malignancy discovery may expand the likelihood of testing threatening malignancy up to ninety percentage. In the year 1994, Franz Nachbaur [3] proposed a clinical dermoscopy strategy for malignancy identification known as *abcd* rule. This standard was surveyed by a scoring condition for every assessment technique. The *abcd* rule works just for melanocytic injuries.

As of late PC frameworks helped practitioners in malignancy recognition. The greater part of the identification frameworks comprises of five principal steps: picture securing, pre-processing, highlight extraction, arrangement,

lastly assessment. There are many distributed papers which center principally around the order frameworks to separate between threatening malignancy and amiable injuries. The article is intended to contemplate the identification frameworks of malignancy that rely upon one of these component extraction strategies: Discrete wavelet transforms (dwt), wavelet packet transforms (wpt) and gabor wavelet transform (gwt). Harmful Lymphoma is hard to be perceived relying just upon vision. There are three principal points in this investigation: Right off the bat, to consider the past strategies that utilized wt and dwt. Secondly to distinguish harmful malignancy with amiable nevus dependent on the drawing out of features by utilizing wpt and wavelet entropy (we) calculation. At the end to decide the best boundary outputs with certain analysis.

2. Related Works

WT has been utilized for picture preparing [13]. Since two decades the modification on the malignancy recognition frameworks has been studied. In the mid 2000 century, wavelets in malignancy recognition have been used by researchers from many years. In the accompanying writing, we will talk about the normal and various strategies for every 5 years.

Hutokshi Sui et al. proposed the method of surface highlight extraction for order of malignancy. The testing strategy utilizes picture handling methods furthermore, man-made consciousness. Pre-preparing is never really input dermis pictures and the picture is divided utilizing referencing technique. From the highlighted portion of picture, few highlights are separated at that point utilizing SVM classifier [6].

M.R.Patil et al, proposed a work on Non-Obtrusive *abcd* observing of Threatening Malignancy utilizing Picture Prepared in MATLAB. He proposed two significant components of a non-invasive time span programmed dermis injury investigation framework for the main location and bar of dermis malignant growth. The essential portion is a time frame mindful to encourage clients prevent dermis consume brought about day light. The picture obtaining, hair discovery what's more, rejection, sore division, includes extraction, and arrangement which is remembered for programmed picture investigation module goes under the subsequent part. The yield is prudent, and the exactness got for kind hearted, different also, dermis malignant growth is more than ninety percent [7].

Terrance DeVries et al, proposed a technique for dermis Sore Characterization utilizing profound multi scale convolutional neural systems. This methodology used an Origin v3 organize pre-prepared on the ImageNet dataset, which is calibrated for dermis injury order utilizing two distinct sizes of info pictures. It is demonstrated that, subsequent precision for malignancy order is less than 1 and for Seborrheic Keratosis is near to 1 [8].

Adri'a Romero L'opez, accomplished a job dependent on the issue of programmed dermis sore identification, especially on malignancy identification, and it is finished by put in semantic division and arrangement from dermoscopic pictures. Utilizing cutting edge strategies to characterize pictures, the impeccably sectioned pictures accomplish 76.66% exactness, while the precision improves to 81.33% when utilizing unsegmented pictures. The affectability is recorded at 84% when utilizing unsegmented pictures and increments to 85.33% when utilizing entirely divided pictures [9].

E. Nasr-Esfahani et al. introduced a work on Malignancy acknowledgment by investigation of clinical pictures utilizing Convolutional Neural System. The CNN classifier, which is set up by enormous number of preparing tests, perceives between malignancy and kind hearted cases. To the extent the exactness of assurance, the outcomes exhibit that the proposed strategy is predominant in relationship with the cutting-edge strategies [10].

3. Methodology

In this paper a general method of detection of boundary of the lesion is performed. The method involves using morphology and wavelets to extract proper boundary be resizing the image. In this area, we present the system embraced in our proposed approach for the division of sores from Dermis within the sight of relics like Dermis lines, vessels, gel and hairs. The proposed calculation comprises of three phases which incorporates: pre-preparing stage for picture improvement alongside hair location/inpainting for antique expelling; division of the injury territory utilizing wavelet-based methodology and afterward at long last post processing stage for improving division results.

In this work the data set is taken from DERMIS and DERMQUEST webs. More than 50 images were tested and boundary detection is been successful.

A. Morphological approaches for images:

A morphological activity is (thoughtfully) characterized by moving a window over the parallel picture to be adjusted, so that it is inevitably focused over each picture pixel, where a nearby consistent activity is performed. Opening expels little items from the frontal area (generally taken as the splendid pixels) of a picture, setting them out of sight, while closing evacuates little gaps in the forefront, changing little islands of foundation into closer view. These methods can likewise be utilized to discover explicit shapes in a picture.

Understand that morphology in this research is explicitly with regards to dermatology. Morphology in dermatology is characterized as the general appearance and structure of a specific Dermis sore in any case of its capacity, etiology or pathophysiology. Morphology can be additionally isolated into essential and auxiliary morphology. As indicated by, Dermis injuries can be gathered into two classifications, essential and auxiliary morphologies. Essential morphologies contrast in shading or surface furthermore, are either obtained from birth, for example, moles or Dermis colorations, or during an individual's lifetime, as for the situation of irresistible ailments and unfavorably susceptible responses. Optional morphologies then again are injuries that outcome from essential Dermis sores, either as a characteristic movement or on the other hand because of disturbing the essential sore. Because of this nature, the morphologies have been found to be essential for classification.

In spite of the tremendous measure of writing examining Dermis sores and morphology, various sources will in general rundown various arrangements of morphologies. Despite these various postings, the portrayal of every morphology is reliable among various references, so any of the references can be chosen and used. For this examination, a subset from the arrangement of morphologies as recorded by [Bic12a] and appeared in Fig. 1 is being utilized. This subset of morphologies was picked to expand the utilization of the information assembled for the exploration. [Wel08a] gave the accompanying brief portrayal of the essential morphologies recorded by [Bic12a]:

- Bulla - a liquid filled delineated height of Dermis that is over 0.5 cm in distance across
- Macule - a little level region with shading or surface contrasting from encompassing Dermis
- Nodule - a strong mass in the Dermis that is touched or raised and is, in distance across both width and profundity, more noteworthy than 0.5 cm
- Papule - a strong rise of Dermis that is under 0.5 cm in distance across
- Patch - a huge level territory with shading or surface varying from encompassing Dermis
- Plaque - a raised region of Dermis without considerable profundity yet is more prominent than 2 cm in distance across
- Pustule - an apparent aggregation of discharge in Dermis
- Vesicle - a liquid filled delineated height of Dermis that is under 0.5 cm in breadth
- Wheal - a white raised compressible and blurred region regularly encompassed by a red flare

As the depictions for every morphology show, morphology in the dermatological sense isn't just alluding to shape yet in addition alluding to visual characteristics, for example, size, shading, surface, and height. Moreover, since no metric information will be used in this examination, the framework is constrained in segregating between morphologies. Another restriction is that this examination centers around Dermis injuries that are marked as one morphology just, though cases wherein a specific Dermis injury can be characterized under numerous morphologies (for example a maculopapular rash has a place with both macule and papule) are not utilized in this examination.

B. WAVELETS FOR IMAGE PROCESSING:

Wavelets are a more general way to represent and analyze multiresolution images. Wavelets are very useful for image compression (e.g., in the JPG-2000 standard) and removing noise. The basic approach to wavelet-based image processing is given as follows: [14]

i. Two-dimensional wavelet transform of the given image is calculated using the formula.
ii. The transform coefficients are adjusted automatically if the criteria are not reached
iii. Then inverse wavelet transform is computed.
iv. The obtained results are evaluated and compared for efficient disease identification.

The wavelet transform has comparable properties to Fourier transform as a numerical strategy for Dermis sores examination, the essential contrast between both is that wavelets are restricted in both time and recurrence, while the standard Fourier transform is just limited in recurrence [14]. At the point when computerized Dermis sore images are seen or prepared at different goals, the Discrete Wavelet Transform (DWT) is the scientific device

of decision. Being a productive and exceptionally natural system for the portrayal and capacity of multi-resolution archive pictures, the DWT gives incredible understanding into a Dermis sores spatial and recurrence quality.

The wavelet transform is essential to give a minimal portrayal of Dermis sores that are constrained in time and it is extremely useful in depiction of edge and line that are exceptionally restricted.

Mathematically Discrete Wavelet transform denoted by w (j, k) is given as,

$$w(r,s) = \int_p f(p)2^{\frac{p}{2}}\psi(2^p p - s)dt \quad (1)$$

The method is evaluated using a fringe error calculated between transformed image and reconstructed image.

4. Results And Discussion

The proposed method is the combination of morphology and wavelets resulted in good identification of borders of the lesion region, which will be useful for easy diagnosis for medical practitioners.

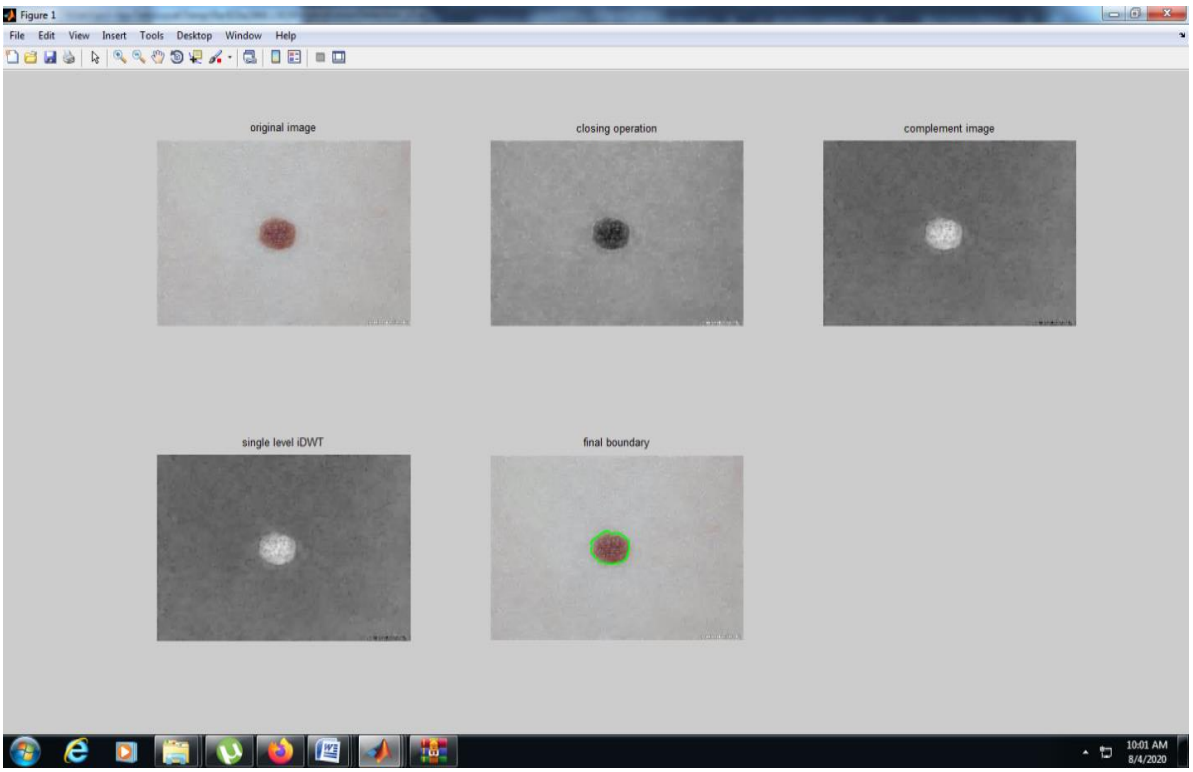

Fig. 1 Morphological operations and wavelets for fringe detection of a Dermis lesion of image Th3.jpg with fringe error 1.19%

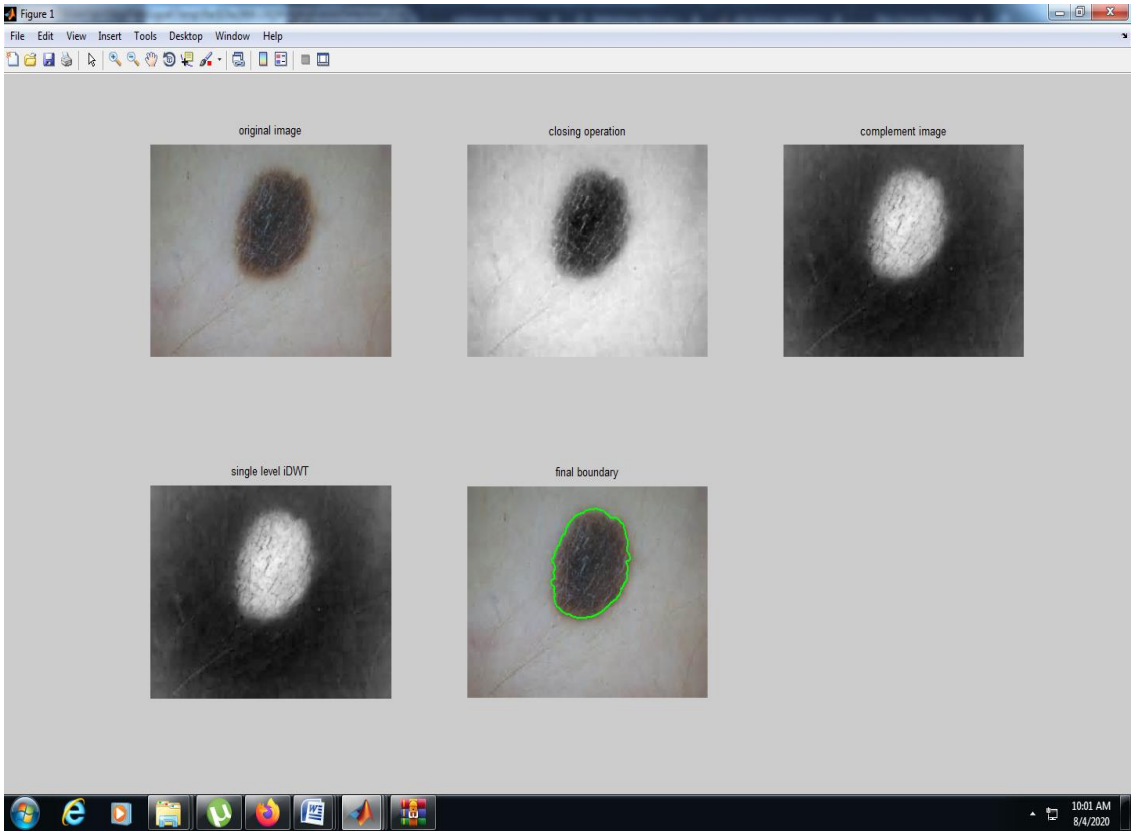

Fig. 2 Morphological operations and wavelets for fringe detection of a Dermis lesion of an image Th5.jpg with Fringe error 2.003%

The percentage border error is given by

$$FE = \frac{Area(AF \oplus MF)}{Area(MF)} 100\% \quad (2)$$

FE, AF, and MF stand for fringe error, Automatic fringe and Manual fringe, respectively. Automatic fringe is the binary image of the lesion border obtained by the propose method, Manual fringe is the binary image of the manual border of the lesion, $\oplus$ is the Exclusive-OR operation that gives the pixels for which the Automatic fringe and Manual fringe disagree, and Area(I) denotes the number of pixels in the binary image I. The proposed method is tested on a set of 100 dermoscopy images.

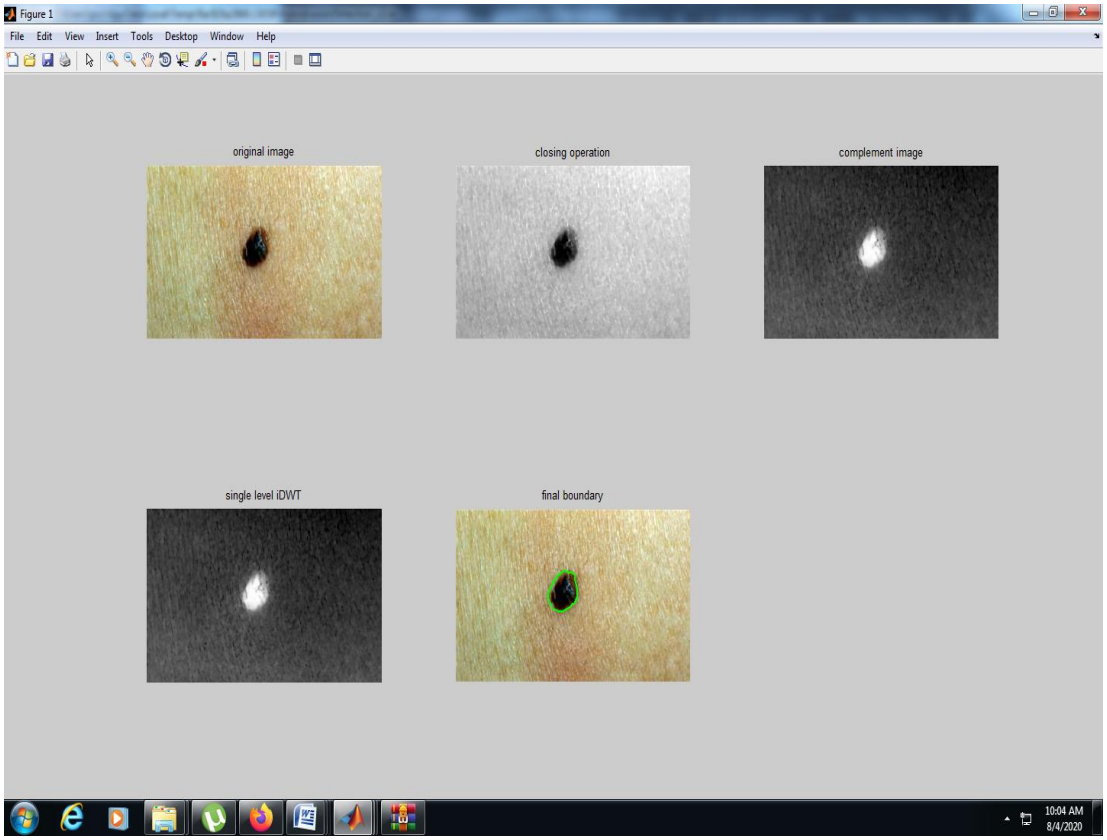

Fig. 3 Morphological operations and wavelets for fringe detection of a Dermis lesion of an image Th4.jpg with fringe error 2.34%

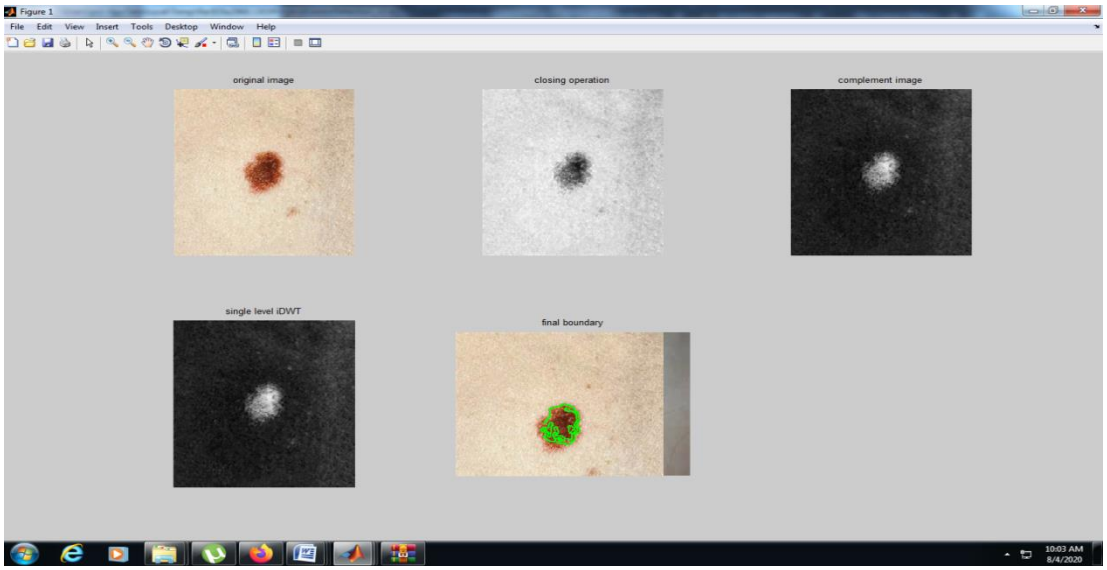

Fig. 4 Morphological operations and wavelets for fringe detection of a Dermis lesion of an image Th11.jpg with fringe error 3.1%

5. Conclusion

A new strategy dependent on wavelet transform and morphology is introduced in the current work for sore fringe identification of dermis sore from dermoscopy pictures. The fringe miscalculation is shown for the pictures in which hair ventures into the canker. The inconvenience of the introduced technique is that it can't distinguish more than one sore in a picture. The proposed strategy can be created so as to diminish the fringe mistake of sore where hairs ventures into the injury and furthermore it could recognize more than one sore in picture.

References

1. R. L. Siegel, K. D. Miller and A. Jemal, "Cancer statistics, 2016," CA: a cancer journal for clinicians, vol. 66 (1), pp. 7-30, 2016.
2. American Cancer Society, "Malignancy Dermis Cancer," 20 March 2015. [Online].
3. [3] Nikhil Cheerla and Debbie Frazier, "Automatic Malignancy Detection Using Multistage Neural Networks," International Journal of Innovative Research in Science, Engineering and Technology, vol. 3(2), pp. 9164 – 9183, 2014.
4. Santosh. A and Sadashivappa. G, " Statistical Analysis of Dermis Cancer Image–A Case Study," Int. J Electron Commun Eng., vol. 3(3), pp. 1-10, 2014.
5. Jeyanthi Kamalakkannan, Bhavani Sankari. S, "Detection of Malignant Dermis Cancer Based on Automated Image Analysis and Classification", International Journal of Innovative Trends and Emerging Technologies, vol. 1(1), May 2015.
6. Hutokshi Sui, Manisha Samala, Divya Gupta, Neha Kudu, 'Texture Feature Extraction for Classification of Malignancy," International Research Journal of Engineering and Technology, vol.5(3), pp. 1026-1029, 2018.
7. M.R.Patil, AboliGhonge, Mansi Dixit, Deep Joshi, "Non-Invasive ABCD Monitoring of Malignant Malignancy Using Image Processing in MATLAB," International Research Journal of Engineering and Technology, vol. 4(3), pp. 1074-1081, 2017.
8. Terrance DeVries, Dhanesh Ramachandram, "Dermis Lesion Classification Using Deep Multi-scale Convolutional Neural Networks," Computer Vision and Pattern Recognition, arXiv:1703.01402v1 [cs.CV], 4 Mar 2017.
9. Adri`a Romero L´opez, "Dermis Lesion Detection from Dermoscopic Images Using Convolutional Neural Networks," Universitat Polit`ecnica de Catalunya, BarcelonaTech, January 2017.
10. E. Nasr-Esfahani, S. Samavi, N. Karimi, S.M.R. Soroushmehr, M.H. Jafari, K. Ward, K. Najarian, "Malignancy Detection by Analysis of Clinical Images Using Convolutional Neural Network," Annual
11. International Conference of the IEEE Engineering in Medicine and Biology Society, 2016, pp. 1373-1376.
12. ISIC, "ISIC Archieve : The International Dermis Imaging Collaboration: Malignancy Project," ISIC, 5 Jan 2016. [Online]. Available: https://isicarchive. com/#. [Accessed 20 Jan 2018].
13. Mariam A.Sheha, MaiS.Mabrouk, AmrSharawy, "Automatic Detection of Malignancy Dermis cancer using Texture Features," International Journal of Computer Applications, vol. 42(20), pp. 22-26, 2012.
14. Chang T, Kuo CJ. Texture analysis and classification with tree-structured wavelet transform. IEEE Trans. Image Process. 1993;2(4):429-441.
15. Manish T. Wanjari, Dr. Mahendra P. DHore, "Document image segmentation using wavelet and Gabor filter techniques, "IOSR Journal Computer Engineering (IOSR-JCR), NCRTCSIT-2016.

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Research Article

An Artificial Intelligence-Based Reactive Health Care System for Emotion Detections

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In the past few years, remote monitoring technologies have grown increasingly important in the delivery of healthcare. According to healthcare professionals, a variety of factors influence the public perception of connected healthcare systems in a variety of ways. First and foremost, wearable technology in healthcare must establish better bonds with the individuals who will be using them. The emotional reactions of patients to obtaining remote healthcare services may be of interest to healthcare practitioners if they are given the opportunity to investigate them. In this study, we develop an artificial intelligence-based classification system that aims to detect the emotions from the input data using metaheuristic feature selection and machine learning classification. The proposed model is made to undergo series of steps involving preprocessing, feature selection, and classification. The simulation is conducted to test the efficacy of the model on various features present in a dataset. The results of simulation show that the proposed model is effective enough to classify the emotions from the input dataset than other existing methods.

1. Introduction

Affective communication is essential in many fields, including public health, crisis response, and feedback analysis, to name just a few [1]. Emotions in humans can be expressed vocally, through text or through physical sensations. Humans are capable of recognising a wide range of emotions and thoughts, but computers are unable to distinguish between the intensity and emotion. In the field of research, emotion analysis is a prominent topic since it provides a means of communicating with machines [2].

Despite the fact that researchers have put a lot of effort into text-based emotion recognition, the applications are diverse. In accordance with the literature, textual data, which include social media content and discussion communities, are the primary source of emotion detection [3]. Based on health data, it is also beneficial to distinguish between positive and negative emotions based on health data because

unpleasant emotions can be harmful and can result in risky mental or physical states of mind. People emotional well-being is modified when they suffer from depression, anxiety, loneliness, and other mental health problems. As a result of this development, the area of psychology is in desperate need of research into the identification and mapping of emotions in text [4].

Because emotions and feelings are not described in the literature, there is no general agreement. What we call feelings are sometimes underappreciated in and of themselves, since they are frequently characterised in terms such as outrage and nausea [5]. It is possible to experience rapid and frequent changes in mood while unwell. We can observe or communicate our interior states through many means, but this depiction is devoid of intellect and meaning. A behaviour that involves extremely complex components, data from a diverse variety of sources, and evidence gathered over a longer period of time, on the contrary, is in opposition to this [6].

As an example, happy or joy is one of the enthusiastic states that can be attained by experiencing typically positive feelings. When a guy is in excellent health, his emotions tend to be more optimistic, and when in poor health, his emotions tend to be more depressed [7]. When people are sick, they experience feelings of unpleasantness, grief, and disappointment, and these feelings can lead to suicidal ideation in the most extreme cases if the disease lasts for an extended period of time. As part of our research, we gathered information about patient emotions from a variety of disease-related news pieces that were posted on a variety of websites [8, 9].

The keyword-based strategy is the most widely used and straightforward method available. This technique searches for the emotive term in the sentence and then a matching pattern is applied in order to extract the keyword [10]. Natural language processing (NLP) techniques can be used to tokenize text, and the intensity of words can also be calculated using these techniques. On the contrary, the Lexicon method uses lexicons to determine the emotions present in a piece of textual material [11]. This approach determines if a keyword has a positive or negative meaning based on the probability of its occurrence. The main problem in this existing scenario is to gather information about patient emotions from a variety of disease-related news pieces that were posted on a variety of websites.

The main contribution in this study is mentioned below:

(i) An artificial intelligence-based classification that aims to classify the emotions from the input data using metaheuristic feature selection and machine learning classification.

(ii) The proposed model is made to undergo series of steps involving preprocessing, feature selection, and classification.

(iii) In the feature selection, the proposed Intelligent Water Drop algorithm is included in the proposed system as a classifier. With the help of an Intelligent Water Drop algorithm, selecting the greatest characteristics or qualities that are near to the best is straightforward.

2. Related Works

By the time, artificial intelligence (AI) became popular; machine learning had already provided some of the most innovative solutions to a wide range of issues, including breakthroughs in linguistics and NLP methodologies [12]. Emotions derived from sentences are classified using a number of algorithms in the field of computer science. Aside from that, researchers employed the lexicon-based approach to predict election results based on the categorization of emotions in Twitter data [13].

Emotional iconography, as well as the written word, is used by the authors in [14] to determine the feelings of their readers. They employ a range of methodologies in their work, including keyword analysis, as well as keyword negation analysis, as well as a collection of proverbs and emoticons. Their calculations show that their approach has a success rate of 87%, which is very high. Several studies in the literature have used NLP approaches to create handwritten dictionaries of common expressions [15].

Several studies on the subject of research have looked into the ways in which writing might convey feelings. Big data were used by the authors in both [16, 17], as well as in other publications. In a separate study [17], the potential of machine learning algorithms to effectively recognise emotions in Internet material was investigated. The results were promising.

In [18], a summary of the datasets and approaches available for emotion analysis is described in detail. According to their research, emotion-labeled datasets are hard to come by and are not available to the general public for use. Third-party APIs are used in many studies on the classification and detection of emotions in text, which is why they are so popular. Sentiment analysis is two of the most frequently encountered applications of the application programming interface (API). Other applications include the identification of malicious intent and the recognition of abusive text.

3. Proposed Method

The proposed model, which is shown in Figure 1, is made to undergo series of steps involving preprocessing, feature selection, and classification.

3.1. Preprocessing. We begin by purifying the data in order to achieve the best results. The use of simple preprocessing techniques such as lowercase conversion, punctuation removal, and stop word removal can help us improve the quality of our output. The steps for text cleaning are detailed in greater detail below.

3.1.1. Lowercase Conversion. Lower case conversion is the first step in the preprocessing process. The text is changed to lower case in order to prevent duplicates from being created when the database is cleaned. In spite of the fact that the terms happy and happy are spelled differently, they are treated as separate words due to differences in case usage.

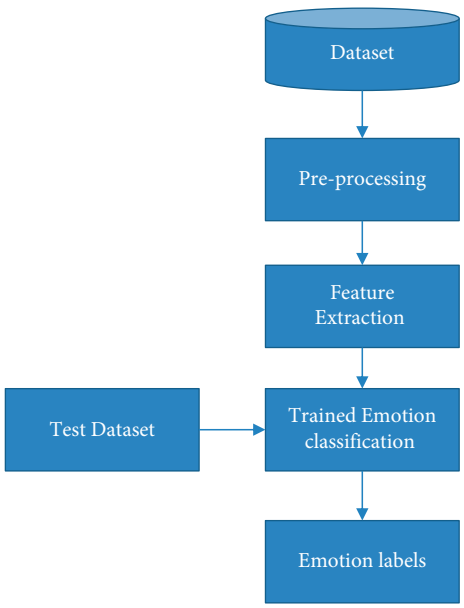

Figure 1: Proposed method.

We employ the lower case conversion approach in order to avoid confusion.

3.1.2. Punctuation Removal. It is required to eliminate all punctuation from the text in order for the model to be trained more effectively. All punctuation occurrences should be removed from the text dataset in order to assist the model in acquiring functional attributes rather than nonfunctional properties.

3.1.3. Removal of Stop Words. Stop words are prior training the machine learning model because they do not provide much context for the text data. Here, the nltk.corpus module in Python is useful because it contains stop words in the English language.

3.1.4. Common Words' Removal. It is standard practise to exclude terms from a corpus if they are too similar to one another. Incorporating overlap in vocabulary into machine learning classifiers' evaluation scores has a negative impact on the results. Due to the fact that their inclusion will have no impact on our text classification, these terms have been omitted.

3.1.5. Rare Words' Removal. In the same way that we deleted the most frequently recurring terms from the text, we also eliminated the terms that appeared just once or twice in the text. Despite the fact that they are extremely rare, noise tends to overshadow their significance.

3.1.6. Resampling. Table 1 indicates unequivocally that the distribution of emotion classes is not uniformly distributed across the board. When dealing with uneven data, data resampling becomes important. When executing a resampling procedure on a dataset, it is possible to over- or under-sample the dataset. The data are resampled to ensure that both the majority and minority classes are taken into consideration.

Table 1: Emotion class label.

Emotion class	Count
Angry	1343
Sad	358
Fear	742
Excited	1215
Bored	22
Happy	522

Table 2: Overall features on EmoHD dataset.

Features	Count
Number of words	1634319
Characters	12090922
Numerics	64543
Unique trigrams	1159467
Unique bigrams	827475
Unique unigrams	91988

After the data have been appropriately balanced, the analysis is carried out from two perspectives, namely, including and excluding the minority class, respectively.

3.2. Feature Selection Using Intelligent Water Drop Algorithm. It is possible to lower classification error rates while also achieving the best results by selecting the best features from a huge dataset.

Intelligent Water Drop algorithm is included in the proposed system as a classifier. With the help of an Intelligent Water Drop algorithm, selecting the greatest characteristics or qualities that are near to the best is straightforward. The work flow of Intelligent Water Drop is determined by the riverbed, the soil, and the drop velocity (features):

$$\text{velocity}(t+1) = \text{vel}(t) + \left(\frac{q}{b_v + c_v * \text{soil}^{2a}(I,j)}\right), \quad (1)$$

where velocity $(t+1)$ = velocity of particles, b_v and c_v denote static, and q denote dynamic parameters.

When using this approach, the best feature is computed by taking into account both static and dynamic characteristics. The static parameters, in contrast to the dynamic parameters, remain constant during the entire procedure, whereas the dynamic parameters change. The Intelligent Water Drop feature selection process begins with the aid of a graph, and the features are dispersed throughout the search area to aid in the process. When the static parameter is determined, the dynamic parameters, velocity, and soil properties are calculated from it, and the values are updated accordingly.

There is a repeating procedure for all of the features, which aids in the identification of the overall solution. A consequence of this is that the abovementioned updating

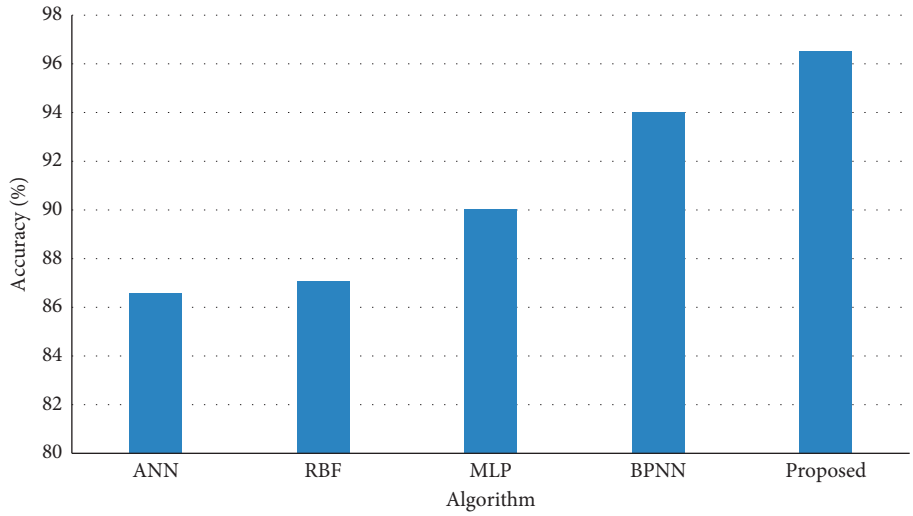

Figure 2: Accuracy on test dataset.

approach gives the attributes that are most relevant for the future categorization stage.

3.3. Classification Using BPNN. According to the researchers (Patterson, 1996), ANNs trained on data from real-world datasets have been successful at projecting the level of a specific event outcome. There have been numerous studies showing that artificial neural networks outperform more traditional statistical pattern detection techniques. For this purpose, it was decided to use a three-layer BPNN structure to estimate the features.

There was a significant amount of features present, which corresponded to the values that were entered. The root mean square error (RMSE) was employed for the purposes of training, validation, and testing. The RMSE was used to determine the ideal number of concealed nodes. The RMSE for the testing set will be calculated by selecting the best hidden nodes.

Step 1: the outputs of the first phase (forward propagation) are calculated depending on the values of the inputs and the weights that are currently in effect. There are several factors that influence the net excitation of each hidden unit and output unit. These include: unit values from earlier layers that are associated with the unit at issue. This function determines the relative relevance of one unit of measurement in comparison to another.

Upon completion of the activation function, the calculated output value for that unit based on this net excitation is returned. It is necessary to have an activation function that is both continuous and differentiable. In BPNN, a number of activation functions can be used to achieve the desired result. The activation function sigmoid is one of the most commonly used.

Step 2: it is possible to estimate the backward propagation of error by comparing the output of the target to the output of each output unit, which is then multiplied by the total number of output units. This mistake has been forwarded to the preceding layer, which is currently hidden. For each unit, the error in the hidden layer N is defined by a mathematical formula. N–1 is the previous hidden layer, and the errors are calculated in a similar manner at each node of N–1, the previous hidden layer. Correcting the weights based on the determined errors reduces the error at each output unit to the bare minimum. When errors are repeated in both the forward and backward directions, they are decreased to the desired level.

4. Results and Discussion

In this section, we discuss the text emotional dataset for detecting the emotional states in patients based on their textual interactions with the researchers. Currently, there is no comprehensive dataset for the automatic emotion recognition in patients via text, as far as we are aware. This work proposes EmoHD as a new standard for the automatic emotion recognition in text data. Using a dataset such as Fer2013, it is possible to detect or recognise facial expressions.

It is necessary, however, for the advancement of research in this sector that the ability to recognise emotions in patients relevant to diseases be mastered (Table 2). The study believes that the following four qualities should be included in every database of healthcare-related news. It is critical to have large samples in each class, as well as an appropriate value assigned to each emotion.

Figure 2 shows the results of accuracy on test dataset (20%) of the entire dataset and the results of simulation shows that the proposed method achieves higher rate of accuracy than BPNN, ANN, MLP, and RBF.

Figure 3 shows the results of specificity on test dataset (20%) of the entire dataset and the results of simulation shows that the proposed method achieves higher specificity than BPNN, ANN, MLP, and RBF.

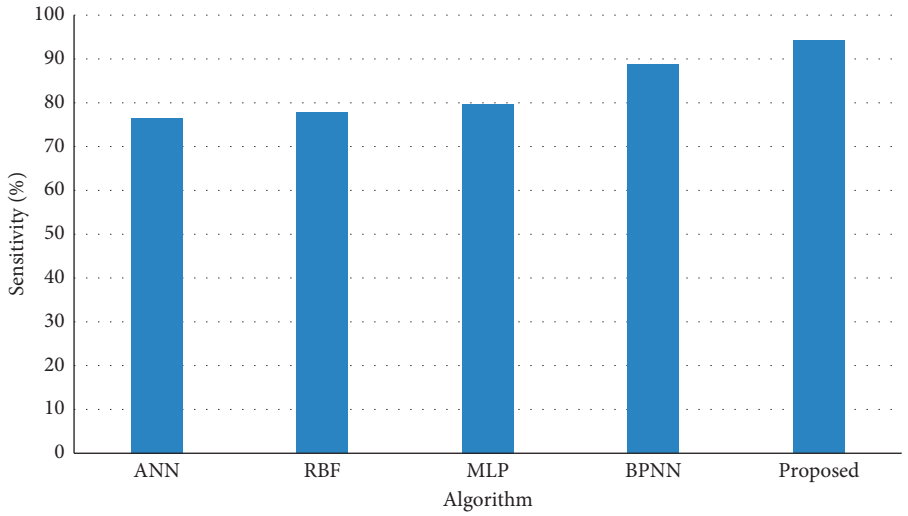

Figure 3: Specificity on test dataset.

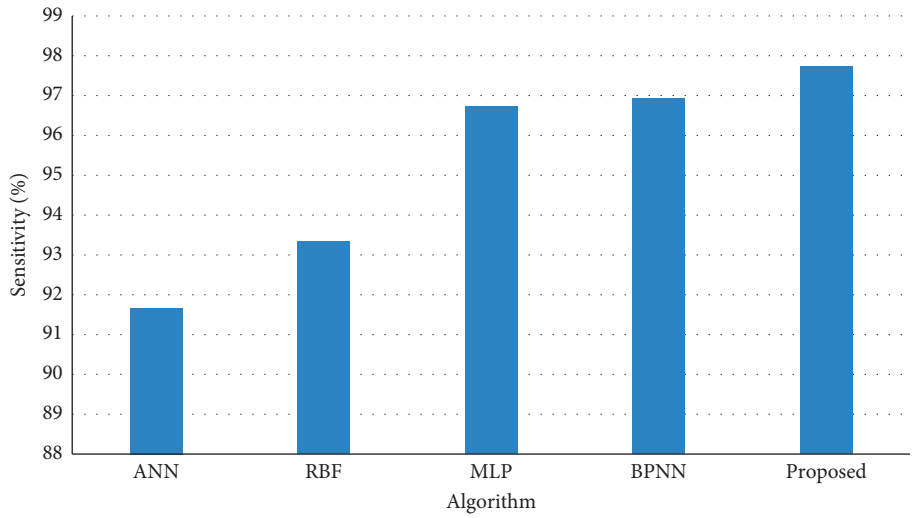

Figure 4: Sensitivity on test dataset.

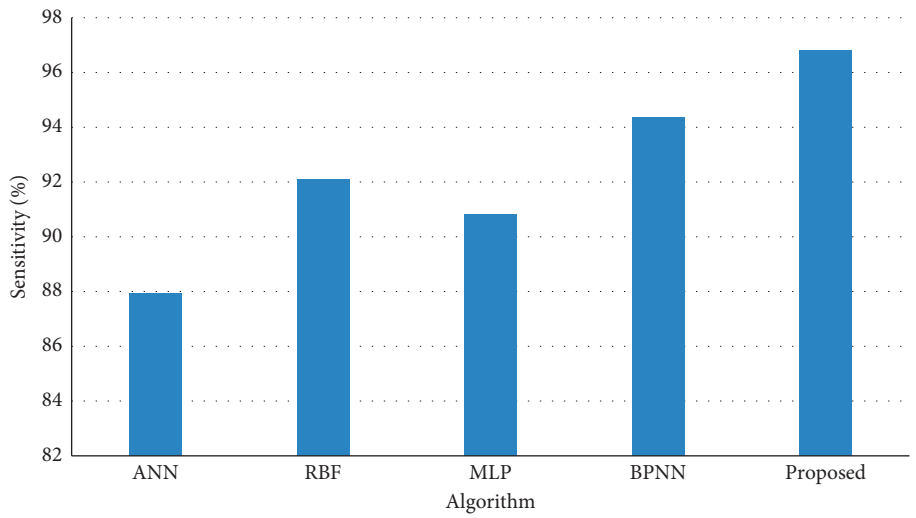

Figure 5: F-measure on test dataset.

Figure 4 shows the results of sensitivity on test dataset (20%) of the entire dataset and the results of simulation shows that the proposed method achieves higher sensitivity than BPNN, ANN, MLP and RBF.

Figure 5 shows the results of F-measure on test dataset (20%) of the entire dataset and the results of simulation shows that the proposed method achieves higher F-measure than BPNN, ANN, MLP, and RBF.

As a result of this technology, it becomes possible to recognise or identify the patient real-time mental state while he or she is receiving treatment. It is necessary to have an emotion-labeled dataset in order to detect emotion in text data from a patient who is suffering from a medical condition. A dataset that has been emotionally labeled and is scattered over a variety of diseases is therefore critically required in this context.

5. Conclusions

In this study, we develop an intelligent water drop-based artificial neural network classification system that aims to detect the emotions from the input data using metaheuristic feature selection and machine learning classification. The proposed model is made to undergo series of steps involving preprocessing, feature selection, and classification. The simulation is conducted to test the efficacy of the model on various features present in a dataset. The results of simulation show that the proposed model is effective enough to classify the emotions from the input dataset than other existing methods. From the results, it is seen that the proposed intelligent water drop-based artificial neural network classification attains a classification rate of 90% than the other existing methods. In future, the accuracy and classification rate can be improvised with some more deep learning algorithms.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author uon reasonable request.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

References

[1] T. Saheb, T. Saheb, and D. O. Carpenter, "Mapping research strands of ethics of artificial intelligence in healthcare: a bibliometric and content analysis," *Computers in Biology and Medicine*, vol. 135, p. 104660, 2021.

[2] K. Ćosić, S. Popović, M. Šarlija, I. Kesedžić, and T. Jovanovic, "Artificial intelligence in prediction of mental health disorders induced by the COVID-19 pandemic among health care workers," *Croatian Medical Journal*, vol. 61, no. 3, pp. 279–288, 2020.

[3] O. Koteluk, A. Wartecki, S. Mazurek, I. Kołodziejczak, and A. Mackiewicz, "How do machines learn? artificial intelligence as a new era in medicine," *Journal of Personalized Medicine*, vol. 11, no. 1, p. 32, 2021.

[4] N. V. Kousik, M. Sivaram, N. Yuvaraj, and R. Mahaveerakannan, "Improved density-based learning to cluster for user web log in data mining," in *Inventive Computation and Information Technologies*, pp. 813–830, Springer, Singapore, 2021.

[5] E. Mbunge, B. Muchemwa, S. Jiyane, and J. Batani, "Sensors and healthcare 5.0: transformative shift in virtual care through emerging digital health technologies," *Global Health Journal*, vol. 5, no. 4, pp. 169–177, 2021.

[6] S. B. Sangeetha, R. Sabitha, B. Dhiyanesh, G. Kiruthiga, N. Yuvaraj, and R. A. Raja, "Resource management framework using deep neural networks in multi-cloud environment," in *Operationalizing Multi-Cloud Environments*, pp. 89–104, Springer, Cham, 2022.

[7] N. Siddiqui Kamal, "Caught off guard by COVID-19: artificial intelligence for rescue!" *Journal of Islamabad Medical & Dental College*, vol. 9, no. 2, pp. 76–78, 2020.

[8] D. Leone, F. Schiavone, F. P. Appio, and B. Chiao, "How does artificial intelligence enable and enhance value co-creation in industrial markets? An exploratory case study in the healthcare ecosystem," *Journal of Business Research*, vol. 129, pp. 849–859, 2021.

[9] S. Balakrishnan, J. Janet, and S. S. Rani, "Symbiotic transformational technology on the rise: artificial intelligence in emotional intelligence," *CSI Communications magazine*, vol. 43, pp. 14–17, 2019.

[10] J. D. McGreevey, C. W. Hanson, and R. Koppel, "Clinical, legal, and ethical aspects of artificial intelligence-assisted conversational agents in health care," *JAMA*, vol. 324, no. 6, pp. 552-553, 2020.

[11] R. A. Bernert, A. M. Hilberg, R. Melia, J. P. Kim, N. H. Shah, and F. Abnousi, "Artificial intelligence and suicide prevention: a systematic review of machine learning investigations," *International Journal of Environmental Research and Public Health*, vol. 17, no. 16, p. 5929, 2020.

[12] F. A. Acheampong, C. Wenyu, and H. Nunoo Mensah, "Text-based emotion detection: advances, challenges, and opportunities," *Engineering Reports*, vol. 2, no. 7, Article ID e12189, 2020.

[13] S. M. Srinivasan, R. S. Sangwan, C. J. Neill, and T. Zu, "Twitter data for predicting election results: insights from emotion classification," *IEEE Technology and Society Magazine*, vol. 38, no. 1, pp. 58–63, 2019.

[14] R. Rahman, "Detecting emotion from text and emoticon," *London Journal of Research in Computer Science and Technology*, vol. 17, no. 3, 2017.

[15] D. D. Gosai, H. J. Gohil, and H. S. Jayswal, "A review on a emotion detection and recognization from text using natural language processing," *International Journal of Applied Engineering Research*, vol. 13, no. 9, pp. 6745–6750, 2018.

[16] A. Chatterjee, U. Gupta, M. K. Chinnakotla, R. Srikanth, M. Galley, and P. Agrawal, "Understanding emotions in text using deep learning and big data," *Computers in Human Behavior*, vol. 93, pp. 309–317, 2019.

[17] M. Z. Asghar, F. Subhan, M. Imran et al., *Performance Evaluation of Supervised Machine Learning Techniques for Efficient Detection of Emotions from Online Content*, Harvard University, Chicago, 2019.

[18] N. Azam, B. Tahir, and M. A. Mehmood, "Sentiment and emotion analysis of text: A survey on approaches and resources," *Language & Technology*, vol. 87, 2020.

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DESIGN OF BRIDGELESS CUK CONVERTER FOR EV CHARGER TO INCRESE THE POWER QUALITY

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ABSTRACT:

A Cuk converter based EV (Electric vehicle) battery charger is designed and developed in this work. It supplies affordable as well as high-power density-based billing service for EV. This charger includes much less variety of tools running over one switching cycle, which minimizes the additional transmission loss incurred by a diode bridge rectifier of conventional battery charger and hence, enhances the charger effectiveness. Throughout constant present and also consistent voltage regions, the commands for battery charging are synchronized by a flyback converter. The included benefit of recommended geography is that the undesirable capacitive combining loophole is eliminated, as well as unwanted conduction via the body diode of non-active button in formerly created BL Cuk converter is prevented. This substantially boosts the charger effectiveness. For the consistent present (CC) and also continuous voltage (Curriculum Vitae) charging, the commands are synchronized by a flyback converter. The suggested charger is examined to demonstrate the improved power quality. Test results validate the better performance of the recommended battery charger.

Keywords: Electrical vehicle, cuk converter, CC, flyback converter, battery charging.

1. INTRODUCTION

Recently, a number of vast towns within the world develops safety and additionally encourages promoting an surroundings-friendly truck, commonly Electric Cars (EVs) in conjunction with Plug-In Crossbreed EVs (PHEVs). In order to boost up its employer putting in place within the market, it is required to get a excessive-performance battery and its charger development, that's the important thing stamina supply of the cars. Among of severa batteries, Nickel Steel Hydride (Ni-MH), Lithium-Ion (Li-Ion) and also Li-Polymer batteries are usually getting used to have an awful good deal better electricity thickness, overall overall performance, safety and protection in conjunction with rate, in addition to also the batteries efficiencies are boosting. There are 2 styles of battery chargers for EV application. One is a standalone kind which might be contrasted to an oil terminal targeted at fast fee. The various different is an onboard kind which can be appropriate for gradual-transferring fee from a residence electricity electrical outlet all through night time, while name for of electric power is decreased. Slow charge over night is really treasured for an electric energy distribution device. Especially, an on-board battery charger wishes to be little similarly to

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mild with an goal to make high-quality use energy effectiveness and the space blanketed consistent with charging. For that purpose, a high frequency converting method is wanted to reduce length of easy additives, and additionally to reduce reworking losses delivered on with the aid of manner of the excessive frequency switching. The battery billing algorithm attitude, many researches are completed to have a high-quality deal far higher battery charging additives, as a circumstances, Consistent Voltage (Curriculum Vitae), Constant Existing (CC), CC-CV, stamina manage as well as pulse shot strategy and so forth, considering lifecycle, defense in addition to safety and security and further performance of the batteries. The broadly speaking all of On-board battery chargers is diode bridge rectifier abided by PFC circuit in an initiative to enhance energy detail of enter cutting-edge and output voltage regulation. Decreased strength thing and additionally harmonics have a harmful outcome on power top class derogatory trendy gadget performance in energy systems. To conquer these scarcities, AC/DC circuits with lively longevity detail correction (PFC) have clearly been hooked up. This PFC circuit's utilization a bridge adhered to.

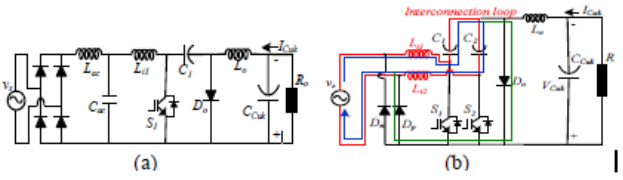

Fig.1.1. Different BL Cuk Converters.

2 LITERATURE SERVEY

C. Chan and K. Chau, "Power digital devices challenges in electrical vehicles," in Proc. IEEE IECON 'ninety three., pp. 701-- 706. In a globe wherein energy conservation as well as environmental control is increasing issues, the development of electrical vehicle cutting-edge era has truly taken a speeded up pace. The 1990s are possibly to he the years in which the lengthy-sought sensible, within your means electrical Heavy vehicle will actually begin to be recognized. The paper offers an overview of existing condition and additionally future fads in electrical vehicle propulsion structures, with attention at the effect of speedy development of electric cars and also electricity electronics. The problems of energy digital devices in other components including battery chargers, electrical brakes as well as different critical programs of electrical vehicle are looked at. The market size of electrical vehicle inside the coming years and additionally the possible electric powered car affects are discussed [1].

B. Tar as well as A. Fayed, "A summary of the ideas of battery chargers," IEEE MWSCAS' sixteen, pp. In this paper gives an introduction of the fundamentals of battery chargers, inclusive of charging formulation as well as circuit execution of linear and also converting battery chargers. Initially, the standard process of batteries is described beneath open circuit, discharging, and also charging situations. Next off, a creation of the heart beat billing scheme and its execution exists, complied with by a précis of the Constant-Current Constant-Voltage (CCCV) charging plan in addition to the unique considerations concerning charging Lithium Ion (Li-Ion) batteries. Linear and additionally converting circuit realizations of the CCCV billing scheme are after that furnished, adhered to by using an creation of battery gasoline-

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gauging circuits, multi cellular battery chargers, and also cellular-balancing strategies [2]

M. Yilmaz and additionally P. T. Krein, "Evaluation of battery charger topologies, billing power levels, as well as centers for plug-in electric and additionally hybrid automobiles," IEEE Purchases Power Electronic devices, vol. 28, no. 5, pp. 2151-- 2169, May 2013. In this paper evaluation the existing standing and also execution of battery chargers, billing electricity degrees, and also framework for plug-in electric vehicles as well as hybrids. Charger systems are classified into off-board and on-board types with unidirectional or bidirectional power drift. Unidirectional billing limits device needs and streamlines affiliation concerns. Bidirectional charging supports battery strength injection back to the grid. Common on-board chargers restriction strength due to weight, location, in addition to price constraints. They can be integrated with the electrical power to avoid these issues. The accessibility of billing framework reduces on-board power garage demands in addition to fees. On-board battery charger structures can be conductive or inductive. An off-board charger can be designed for high billing charges and is a great deal less constrained with the aid of measurement and weight. Degree 1 (ease), Level 2 (key), and additionally Degree 3 (speedy) power levels are reviewed. Future factors which include roadbed charging are provided. Various energy degree chargers and also infrastructure configurations are offered, in comparison, as well as assessed based totally upon amount of electricity, charging time in addition to location, price, devices, in addition to different aspects [3]

S. S. Williamson, A. K. Rathore, and additionally F. Musavi, "Industrial electronic gadgets for electrical delivery: Present reducing aspect and also destiny difficulties," IEEE Purchases Industrial Electronics, vol. 62, no. Five, pp. 3021-- 3032, May 2015. In this paper the cutting-edge study patterns and destiny issues for commercial digital gadgets related to transportation electrification. Specific recognition is placed on electric in addition to plug-in crossbreed electric automobiles (EVs/PHEVs) and their crucial drivetrain additives. The paper manages marketplace associated EV electricity garage device troubles, EV charging troubles, in addition to power electronic gadgets as well as grip motor drives problems. The relevance of battery cell voltage equalization for series-related lithium-ion (Li-ion) batteries for prolonged life time is presented. Additionally, an in depth overview of EV/PHEV battery charger category, necessities, and wishes is presented. A variety of traditional EV/PHEV front-give up ac/dc battery charger converter geographies in addition to separated DC/DC geographies is assessed. Lastly, this paper evaluates numerous EV propulsion machine styles and green bidirectional DC/DC converter topologies. Novel DC/AC inverter inflection strategies for EVs are also provided. The styles are based at the battery voltage, capacity, and using variety.

3. OVER VIEW OF PROJECT

The extensive functions of suggested charger to decrease above worries are summarized as follows.

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- The intermediate capacitors are performing individually, in both fifty percents; as a result, distributing losses are removed, which ends up into boosted performance of the battery charger.
- There isn't any return modern-day through the body diode of non-active buttons within the different 1/2 cycle because of used manipulate. For that reason, losses inside the button are reduced.
- The manipulate of the PFC converter is simple thanks to use of precise identical gateway force as well as control circuitry for every and every half of cycles. The result inductors of counselled Cuk converter are developed small sufficient to ensure converter operation in DCM (Discontinuous transmission placing), for that reason, the rate and additionally size of the converter, are decreased.

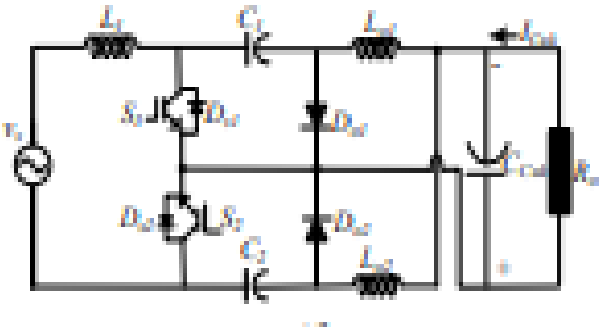

Fig.2.1. Power flow model.

3. METHODOLOGY AND DESULTS EXPLANATION

The manager of PFC converter is easy due to use equal gate pressure similarly to control wiring for each half cycles, i.E. Each the buttons S1 and S2 operate with equal vehicle purpose pressure signal, in twist of fate. Simply positioned, as a manner to lower the conduction loss through the frame diode of the non-energetic buttons, an appropriate identical driving force sign and interleaved chauffeur sign can be carried out to manipulate buttons S1 and also S2. As a stop result, losses within the body diode are decreased. The real operating modes are pretty distinct.

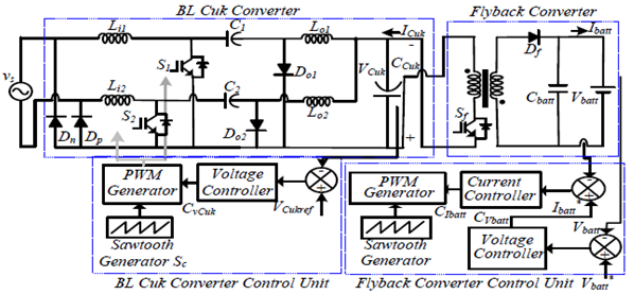

Fig.3.1. Proposed model.

The enter inductors Li1 and Li2 are selected to perform in CCM for both the Cuk converter cells. However, the layout of end result inductors Lo1 in addition to Lo2 is made superb which encompass the output diode cutting-edge, iD finally ends up being no and moreover the converter enters DCM over one changing cycle. The intermediate capacitors C1 and additionally C2 are selected consisting of the voltage during capacitors, is still regular within the direction of the switching length. It deserves to issue out that both switches S1 and S2, are driven making use of the very same PWM sign, which decreases the system expense and also circuit complexity.

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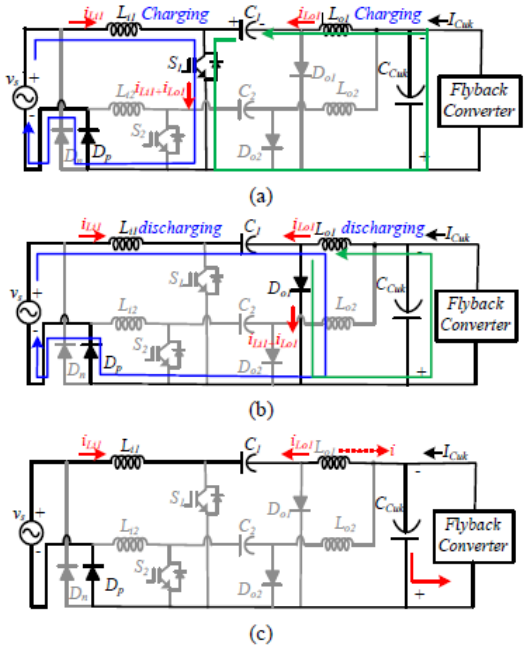

Fig. 3.2. Circuit Operation of EV Charger with BL PFC Cuk Converter at some stage in favorable 1/2 cycle (a) Mode P-I (b) Mode P-II (c) Setting P-III.

This implies that in +ve 1/2 of cycle operation, at the identical time as switch S1 gets on, the current-day blood circulations no extra fine with Dp however likewise part of this present returns through the shape diode of switch S2 in a comparable manner to inductor Li2. Likewise, even as button S1 is block, the cutting-edge now not essentially activities via the road diode Dp via genuinely very last results diode Do1, but some existing similarly undertakes inductor Li2 the use of frame diode, Dp. Similar example takes place for the-- ve half cycle machine with transfer S2. This takes location because of the single PWM indicator being executed to fine one of the switches throughout one fifty percentage i.E S1 or S2 and furthermore high-quality switch is dispersed for different half of virtually. As a cease result, the circuit generally sustains some losses throughout the body diode of the non-lively button (S1 or S2) because of in thing move again cutting-edge-day flow thru it within the course of the respective fifty percent of cycle technique, that is sizeable.

SIMULATION RESULTS:

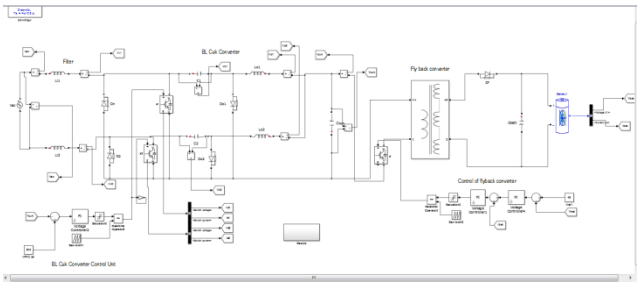

Fig.3.3. Simulation circuit.

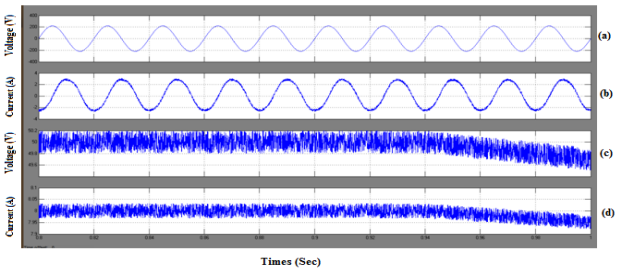

Fig.3.4. Source and Battery side quantities.

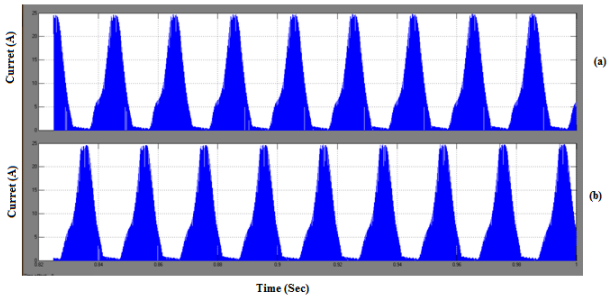

Fig.3.5. Output inductor current (a)ilo1=28A (b) ilo1=28A.

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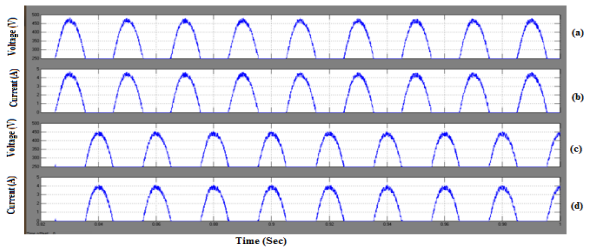

Fig.3.6. charger Capacitor voltages in CCM (no return current through Li1 and Li2 in –ve and +ve half respectively.

The voltage and current stress through the PFC switches *S1* and *S2* during the respective half cycle, with proposed BL Cuk converter and with BL converter topology-1 in fig. 3.3. to fig.3.5. It is clear from the recorded switch current waveforms that switch current *is1* and *is2* has no effect of circulating current flow during the +ve and –ve half cycle operation. Therefore, it is evident that proposed BL Cuk converter has no circulating current flowing through the input inductors *Li1* and *Li2* as there is no interconnection of intermediate capacitors to form circulating current loop, as mentioned earlier in the topological discussion in Fig.3.5.

Performance of Charger at Wide Fluctuations in Input Voltage:

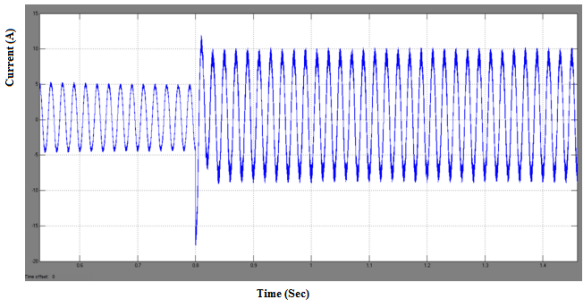

Fig.3.7. Mains current increased AC mains current (10A).

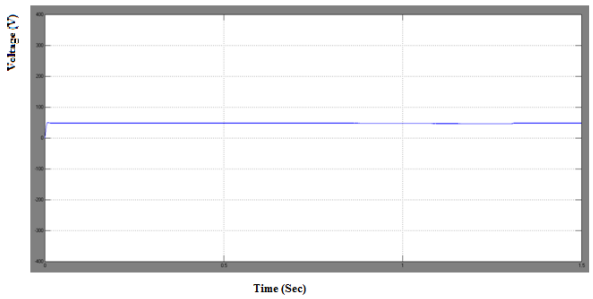

Fig.3.8. Battery voltage (50V).

Improved Power Quality Parameters at AC Mains:

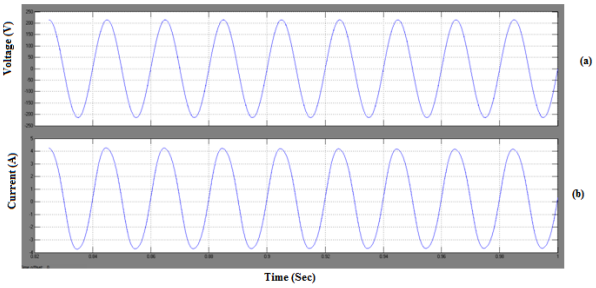

Fig.3.9. Main voltage and currents.

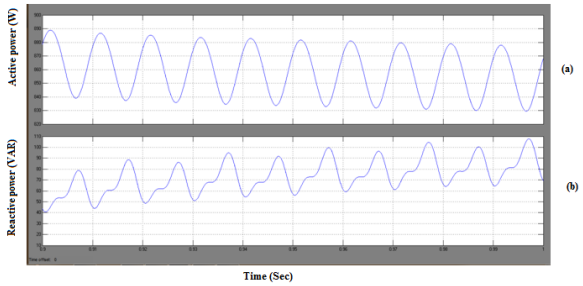

Fig.3.10. (a)Active power (b)Reactive power.

Similarly, there is no return current seen through *Li1* during –ve half cycle, unlike previous BL Cuk converter topology-3 with conventional control, as shown in Fig. 3.6. It is worth to note that BL Cuk converter with conventional control has small amount of current flowing through *Li2*

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during +ve half line, which is obtained due to the path provided by the body diode of inactive switch *S2* during +ve half. Similarly, *Li1* also shows small amount of current flowing through it during – ve half line as body diode of inactive switch *S1* is conducting during this instant. Therefore, the converter efficiency is seen to be low due to losses incurred by the body diode of inactive switch show in Fig.3.9 and fig.3.10.

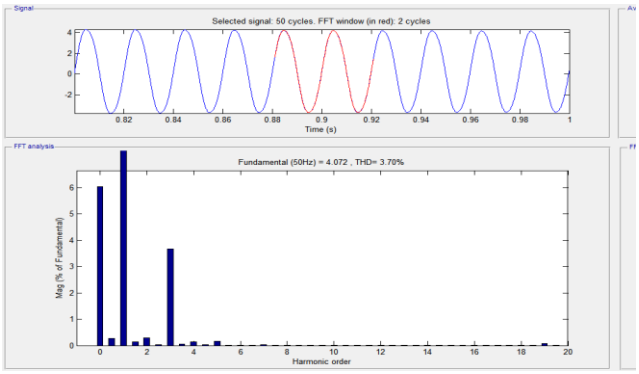

Fig.3.11. THD of source voltage = 3.70%.

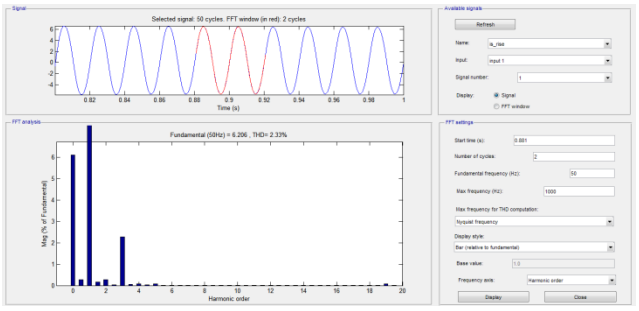

Fig.3.12. THD of source voltage (sudden rise in source voltage)= 2.33%.

Therefore, the converter rejects any transients in the mains voltage to maintain DC link voltage of PFC converter constant, to provide an uninterrupted charging to the battery. To maintain the, power flow of the charger during the perturbation period, sudden corresponding dip or rise in source current, is seen for 50% rise and dip in grid voltage, respectively. The mains current is seen to be sinusoidal with low current THD and a stable charging operation is observed throughout the mains voltage variation range.

CONCLUSION:

An progressed PQ based totally EV charger is proposed with BL Cuk converter being composed much less variety of engaging in additives over single changing cycle. The recommended PFC Cuk converter makes use of incredible PFC attributes in DCM mode using single voltage responses manipulate. As an end result, the dimensions of the battery charger is diminished. The added advantage of advocated geography is that the unwanted capacitive combining loophole is eliminated, as well as unwanted transmission through the body diode of non-active switch in formerly superior BL Cuk converter is prevented. This dramatically boosts the battery charger effectiveness. The proposed battery charger has virtually demonstrated adequate billing features in some unspecified time in the future of regular nation and moreover over 50% version in grid voltage. However, the PQ assessment of endorsed battery charger is received in keeping with the IEC 61000-three-2 standards over big enter voltage array. Consequently, the counseled battery charger provides the feasible EV billing preference for stepped forward power high first-rate and additionally effectiveness.

REFERENCES

[1] J. Kim, G. Choe, H. Jung, B. Lee, Y. Cho, and moreover K. Han. "Layout and Application of a High-Efficiency OnBoard Battery Charger for Electric Autos with Frequency Control Strategy" IEEEVehicle Power similarly to Propulsion Seminar, pp. 1-6, September 2010.

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

[2] X. Yan, and moreover D. Patterson "A High-Efficiency On-Board Battery Charger with Unity Input Power Aspect" Australasian Colleges Power Style Workshop, pp.306-312, September 1999.

[3] M. Morcos, C. R. Mersman, G. G.Sugavanam, and N. G. Dillman, "Battery battery chargers for electric powered lorries," IEEE Power layout Review, Vol. 20, No. Eleven, pp. Eight-eleven, November 2000.

[4] Y. C. Chiang, Y. L. Ke, H. S. Chuang, and moreover H. K. Chen, "Execution and assessment of a superior seriesloaded powerful dcdc converter walking over resonance for battery chargers," IEEEIndustrial and moreover in addition Industrial Power Systems Technical Fulfilling, pp. 1- 8, May 2008.

[5] Y. C. Chuang and furthermore Y. L. Ke, "High-regular not unusual usual overall performance extra to lowstress ZVT-PWM DC-to-DC converter for battery charger," IEEE Trans. Ind. Electron., Vol.
Fifty five, No.
Eight, pp. 3030-3037, August 2008.

[6] J. J. Chen, F. C. Yang, C. C. Lai, Y. S. Hwang, further to moreover R. G. Lee," An excessive ordinary performance multimode Li-Ion battery charger with variable cutting-edge deliver and handling previousstage provide voltage," IEEE Trans. Ind. Electron., Vol. Fifty six, No. 7, pp. 2469-2478, July 2009.

[7] S. Y. Tseng, T. C. Shin, S. Y. Fan, similarly to furthermore G. K. Chang, "Style and moreover execution of lithium-ion/lithiumpolymer battery charger with resistance affiliation," IEEE International Meeting on Power Electronics further to Drive Solution, pp. 866-870, November 2009.

[8] S. Cuk, "True Bridgeless PFC Converter Attains Over 98% Performance, no.999 Power Element," Power Electronics Development, Vol. 36, No. Eight, pp. 34-40, August 2010.

[9] M.R. Abedi and furthermore furthermore F. Tahami, "Evaluation and format of searching for manage method for Sheppard-Taylor primarily based simply truely essentially PFC rectifier," seventeenth IEEE International Symposium on Industrial Electronic tool, pp. 397-402, July 2008.

[10] S. Chen, Z. R. Li and C. Chen, "Analysis and moreover Design of SingleStage AC/DC LLC Resonant Converter," IEEE Purchases Industrial Electronic devices, vol. Fifty nine, no. Three, pp. 1538-1544, March 2012.

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AGRI ROBOT FOR MULTIPURPOSE APPLICATIONS

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ABSTRACT:
The project presents about the multiple agricultural tasks done by the single robot. To develop the efficiency of the agricultural tasks we have to find the new ways. This project deals with a novel approach for cultivating lands in very efficient way. The distinctiveness of this agriculture robot system is it is multitasking abilities which can drill, pick and place, seeding, pumping water & fertilizers, weather monitoring to work in both agriculture, forestation and gardening platform. The project aim is design, development and the fabrication of the robot which can dig soil, put seeds, roller to close the mud and sprayer to spray water, this whole system of robot works with the help of battery and solar power. More than 40% of the population in the world chooses agriculture as the primary occupation, in recent years the development of the autonomous vehicles in the agriculture has experienced increased interest.
Keywords: Soil moisture level, iot server, TELNET.

1. INTRODUCTION:

The idea of applying robotic technology in agriculture is very new, the opportunities for robot enhanced productivity immense. The robots performing agriculture operations such as ploughing , seed sowing and water spraying. Allowing farmers to reduce the environmental impact, increase precision and efficiency, and manage individual plants in novel ways. The Principle- The main impact for our project has been to develop a solar operated digging machine, which is solar powered. In this machine, we used a solar panel to capture and convert solar energy into electrical energy which is used to charge a 5v battery. This gives the necessary power to a DC motor. With the help of Bluetooth, we connect all the commands through our mobile phone. This power is transmitted to the rear wheel through gears. In this project it makes the electric and mechanical systems share their power in efficient way. It reduces the running cost of digging machine. Purpose- Multipurpose agriculture robot can perform the following functions. v Robot vehicle can dig the soil, put the seeds and spray water. v To reduce human effort in agricultural field. v To perform all 3 operations at single time, hence increases production and saves time. v Farmers can operate this robot through smartphone by sitting at a place and can easily operate. v The usage to solar can be utilized for battery charging. As robot works in field, the rays of sun can be used for solar power generation. v To increase the efficiency , the solar power is used and the power output can be increased. v It can be used for small fields. v It can see the view of ground with camera. v Robot can move automatically in field. About Machine- The robot can dig the soil, put the seeds and spray water, these whole system of the robot works with the battery and the solar power.

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More than 40% of population in the world chooses agriculture as the primary occupation, in recent years the development of the autonomous vehicles in the agriculture has experienced increased interest. The vehicle is controlled by Bluetooth controller (Through mobile phone) and camera is used for seeing the view of ground. The advantage of this robot :- It is hands-free & controlled with radio waves. In the field of agriculture, a concept been developed to use multiple small machines which could be more efficient than traditional large tractors & human forces. *Features- v Automatic grass cutter v Automatic seedling v Sprinkling Fertilizer v Sprinkling Irrigation v Solar power operated v Automated with mobile phone v Hydraulic Cultivator v Live view of ground through camera How it works- The basic aim of our project is to develop a multipurpose agriculture robot, which is used to digging the soil, sowing the seeds and spraying the water with least changes in accessories with minimum cost. This whole system of robot works with battery and the solar power. v The basic frame is made for the robot with 4 wheels connected and the rear wheels are connected with motor. v At one end of the frame, cultivator is fitted which is also driven by DC motor and design is made to dig the soil. v Funnel is used to store the seeds and fertilizers, it flows through the funnel by drilled hole on the shaft to the digged soil. v On the end sprayer is fitted to spray water. v Solar is placed on the top of the robot and is connected to a battery for charging the battery. v Front side of the frame Camera is fitted to see the view of ground. v Firstly, we can send data through our own app that is developed by us, with the help of Bluetooth connectivity. v Bluetooth module receives the data according to our program that is in arduino. v Then Arduion sends data to relay module and then switch is put to on/off. Conclusion- In agriculture, the opportunities for robot enhanced productivity are immense and robots are appearing on farms. The other problems associated with autonomous farm equipment can probably be overcome with technology. This equipment may be in our future but there are important reasons for thinking that it may not be just replaced by human driver with computer.it may mean a rethinking of how crop production is done. Crop production may be done better and cheaper with a swarm of small machines that with a few large ones. One of the advantages of the smaller machines is that they may be more acceptable to the non-farm community. The jobs in agriculture are drag, dangerous, require intelligence and quick, thought highly repetitive decision hence robots can be rightly substituted with human operator. The higher quality products can be sensed by machines (color, weight, density, ripeness, size, shape) accurately. Robots can improve the quality of our lives but there are down sides. The present situation in our country all the agricultural machine is working on manual operation otherwise by petrol engine or tractor is expensive, farmer can't work for long time manually to avoid this problem, we need to have some kind of power source system to operate the digging machine. Advantages- v To implement a prototype model of drilling and seed sowing machine system within the limited available source and economy. v The system can be subjected to further development using advanced techniques. v It may become a success if our project can be implemented throughout our country.

2. LITERATURE SURVEY

In modern era, the main problem in agriculture field include lack of farm labor availability, lack of knowledge regarding soil testing, increase in labor wages, wastage of seeds and more wastage in water. To overcome all these disadvantages the robot for agriculture has been proposed. The main aim of agricultural robot is applying robotic technology in agricultural field. The agriculture robot efficiently performs ploughing, seeding and mud leveling automatically. The robot is a mechanical device which

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is capable of performing various tasks without human intervention. The robot works based on command given by the controller. Various sensors are used for sensing various parameters along the robotic path. The microcontroller being the heart of the robotic system manipulates entire the action of the robotic system. It also controls a wheel motion by controlling the DC motors. Motor driving circuit is used to drive the DC motors which in turn control the wheel motion. The seeding robot for agricultural purpose is an autonomous robot which is controlled remotely through a wireless Bluetooth connectivity between the Smartphone and the robot. The Bluetooth electronics app is used to operate the robot. It is used to control each and every operation of the robot.

2.1. "Agricultural Robot for Automatic Ploughing and Seeding" 2015 IEEE International Conference on Technological Innovations in ICT (TIAR 2015) (Amrita Sneha.A, Abirami.E, Ankita.A, Mrs. R. Praveen, Mrs. R. Srimeena). This paper strives to develop a robot capable of performing operations like automatic ploughing, seed dispensing. It also provides manual control when required and keeps tabs on the humidity with the help of humidity sensors .The main component here is the AVR At mega microcontroller that supervises the entire process. Initially the robot tills the entire field and proceeds to ploughing, simultaneously dispensing seeds side by side. On the field the robot operates on automated mode, but outside the field is strictly operated in manual mode.

2.2. "Design and Implementation of Seeding Agricultural Robot" (JIRAS) (P.Usha, V. Maheswari, Dr. V. Nandagopal) In this paper, the robot system is used to developthe process of cultivating agricultural land without the use of man power. The aim of the paper is to reduce the man power, time and increase the productivity rate.

2.3. "Automated Farming Using Microcontroller and Sensors" (IJSRMS) ISSN: 23493371 (Abdullah Tanveer, Abhishek Choudhary, Divya Pal, Rajani Gupta, Farooq Husain) Farming can be done using new technologies to yield higher growth of the crops. In this project we are going to check temperature, light, humidity and soil moisture. The paper here is all about automatic control features with latest electronics technology using microcontroller and GSM phone line. The project works automatically and hence reduces the manpower.

2.4. "IOT Based Smart Agriculture" IJARCCE June 2016 (Nikesh Gondchawar1, Prof. Dr. R. S. Kawitkar2) In this paper a project model for agriculture robot is describe the newer scenario of decreasing water tables, drying up of rivers and tanks, unpredictable environment present an urgent need of proper utilization of water.

3. METHODOLOGY

In modern era, the main problem in agriculture field include lack of farm labor availability, lack of knowledge regarding soil testing, increase in labor wages, wastage of seeds and more wastage in water. To overcome all these disadvantages the robot for agriculture has been proposed. The main aim of agricultural robot is applying robotic technology in agricultural field. The agriculture robot efficiently performs ploughing, seeding and mud leveling automatically. The robot is a mechanical device which is capable of performing various tasks without human intervention. The robot works based on command given by the controller. Various sensors are used for sensing various parameters along the robotic path. The microcontroller being the heart of the robotic system manipulates entire the action of

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the robotic system. It also controls a wheel motion by controlling the DC motors. Motor driving circuit is used to drive the DC motors which in turn control the wheel motion. The seeding robot for agricultural purpose is an autonomous robot which is controlled remotely through a wireless Bluetooth connectivity between the Smartphone and the robot. The Bluetooth electronics app is used to operate the robot. It is used to control each and every operation of the robot.

OBJECTIVES

• To build a battery operated smart agricultural robot for multipurpose farm activities.

• It should check the moisture content in soil, humidity of surroundings and temperature of seed.

• The ground should be dug to the specified depth and the adequate amount of seeds has to be dispensed then it should level the mud after seeding operation.

• It should be easy to operate andsafe handling.

OPERATION

The methodological procedure, circuit diagram and the block diagram are included in this section. The development of the agricultural robot consists of the integration of hardware techniques and software tools. Fig. 4 shows the block diagram of agricultural robot. Arduino Uno microcontroller is the master controller of the developed robot. All the operations of the robot are controlled through Bluetooth connectivity. The robot for agricultural purpose is an autonomous robot which is controlled remotely through a wireless Bluetooth connectivity between the Smartphone and the robot. The Bluetooth electronics app is used to control each and every operation of the robot. The Bluetooth HC-05 module is fixed on to the robot which receives signals from the Bluetooth electronics app and sends these signals to the microcontroller for processing of operations. The microcontroller is powered by a 12V DC battery and it consists of a voltage regulator, which is used to regulate the voltage input for the controller. The microcontroller gives a 5V supply to the driver circuit. This supply is insufficient to actuate DC motors. Thus driver circuit amplifies 5V current into 12V current and drives the motors connected to it. The L293D motor driver 1 circuit is used to control the bidirectional motion and receives signals from the microcontroller. The DC motors control wheel motion and other activities of the robot. The microcontroller sends signals like 00,01,10,11. When signals are like 00 or 11 then the motor is in off condition so there is no movement of robot occur, if else the signal like 01 then the motor will rotate on backward direction else the motor rotate on forward direction(when signal is 10).

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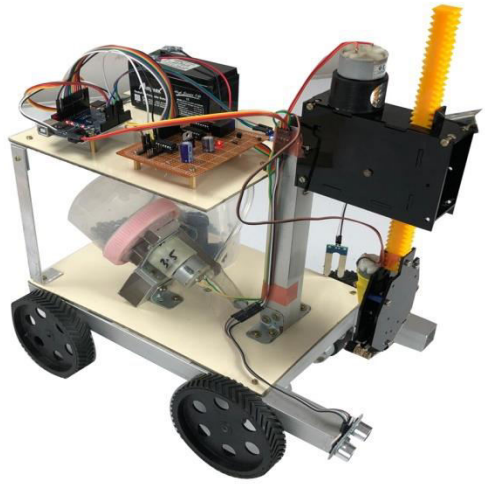

Fig.1. Hardware kit.

CONCLUSION

An attempt has been made to develop a Bluetooth operated agricultural robot which performs ploughing, seed sowing and mud levelling operations. The proposed system is battery operated and controlled by Bluetooth device. Using this robot, farmer can carry out other secondary activity along with operating the robot. By carrying out multiple activities at the same time, farmer can increase his income which results in development of Indian economy.

REFERANCES

[1] Vishnu Prakash K, Sathish Kumar V, Venkatesh P, Chandran A, "Design and fabrication of multipurpose agricultural robot", International Journal of Advanced Science and Engineering Research, Volume: 1, Issue: 1, June 2016, ISSN: 2455 9288.

[2] Ankit Singh, Abhishek Gupta, Akash Bhosale, Sumeet Poddar, "Agribot: An Agriculture Robot", International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 1, January 2015 ISSN (Online): 22781021 ISSN (Print): 2319-5940.

[3] Mr.Sagar R. Chavan, Prof. Rahul D. Shelke, Prof. Shrinivas R. Zanwar, "Enhanced agriculture robotic system", International journal of engineering sciences & research technology, ISSN: 2277-9655.

[4] 4. Nithin P V, Shivaprakash S, "Multipurpose agricultural robot", International Journal of Engineering Research, ISSN: 2319- 6890)(online),2347-5013(print) Volume No.5 Issue: Special 6, pp: 1129 - 1254.

[5] Ms. Aditi D. Kokate, Prof. Priyanka D.Yadav, "Multipurpose Agricultural Robot", International Advanced Research Journal in Science, Engineering and Technology National Conference on

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 12, S Iss 1, Jan 2023

Emerging trends in Electronics & Telecommunication Engineering (NCETETE 2017), ISSN (Online) 2393-8021 ISSN (Print) 2394- 1588.

[6] L.Manivannan, M.S.Priyadharshini, "Agricultural Robot", International Journal of Advanced Research in Electrical, Electronics and Instrumentation, Volume 5, Special Issue 1, March 2016, ISSN (Print) : 2320 – 3765, ISSN (Online): 2278 – 8875.

[7] Mahesh.R.Pundkar, a seed-sowing machinea review, IJESS Volume3, Issue3 ISSN:2249.

[8] Sankaranarayanan M, "Development Of APush Type Seed Drill For Sowing Maize InRwanda". Institut Supérieur d'Agriculture etd' Elevage, ISAE, Busogo, Post Box No.210, Musanze, Rwanda.

[9] Rolando P, "Development of a manually operated disc-type corn seeder".

[10] Ed Dager, "Proper Equipment for Small Farms" Kaitlin D'Agostino, Economics, SAS '13, Rabin, 12/03/09.

[11] Parameshachari B D et. Al Optimized Neighbor Discovery in Internet of Things (IoT), 2017 International Conference on Electrical, Electronics, Communication, Computer and Optimization Techniques (ICEECCOT), PP 594-598, 978-1-5386- 2361-9/17/$31.00 ©2017 IEEE.

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AIR QUALITY MONITORING SYSTEM BY USING IOT

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ABSTRACT:

Humankind, moving to a period cantered upon improvement has overlooked the significance of supportability and has been the real guilty party behind the rising Pollution levels in the world's air among all other living life forms. The Pollution levels at certain spots have come to such high degrees that they have begun hurting our very own It will being. An IoT based Air Pollution observing framework incorporates a MQ Series sensor interfaced to a ARDUINO UNO outfitted with an ESP8266 WLAN connector to send the sensor perusing to a Thing Speak cloud. Further extent of this work incorporates an appropriate AI model to foresee the air Pollution level and an anticipating model, which is fundamentally a subset of prescient displaying. As age of poisonous gases from ventures, vehicles and different sources is immensely expanding step by step, it winds up hard controlling the dangerous gases from dirtying the unadulterated air. In this paper a practical air Pollution observing framework is proposed. This framework can be utilized for observing Pollutions in demeanor of specific territory and to discover the air peculiarity or property examination. The obligated framework will concentrate on the checking of air poisons concentrate with the assistance of mix of Internet of things with wireless sensor systems.

Keywords: MQ, ESP8266, ARDUINO UNO.

1. INTRODUCTION:

Continued exposure to environments with poor air quality is a major public health concern in developed and developing countries. It is estimated that the pollutants responsible for poor air quality cause nearly 2.5 million premature deaths per year world-wide. Significantly, around 1.5 million of these deaths are due to polluted indoor air, and it is suggested that poor indoor air quality may pose a significant health risk to more than half of the world's population. Due to its link with industrialization, societal health problems associated with poor air quality disproportionately affects developed and developing nations – it is estimated that air pollution is responsible for the premature deaths. Remedial action to improve air quality is often easy to implement once airborne pollutants have been detected. Air pollution is the biggest problem of every nation, whether it is developed or developing. Health problems have been growing at faster rate especially in urban areas of developing countries where industrialization and growing number of vehicles leads to release of lot of gaseous pollutants. Harmful effects of pollution include mild allergic reactions such as irritation of the throat, eyes and nose as well as some serious problems like bronchitis, heart diseases, pneumonia, lung and aggravated asthma. According to a survey, due to air pollution 50,000 to 100,000 premature deaths per

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year occur in the U.S. alone. Whereas in EU number reaches to 300,000 and over 3,000,000 worldwide. IOT Based Air Pollution Monitoring System monitors the Air quality over a web server using Internet and will trigger an alarm when the air quality goes down beyond a certain threshold level, means when there are sufficient amount of harmful gases present in the air like CO2, smoke, alcohol, benzene, NH3, LPG and NOx. It will show the air quality in PPM on the LCD and as well as on webpage so that it can monitor it very easily. LPG sensor is added in this system which is used mostly in houses. The system will show temperature and humidity. The system can be installed anywhere but mostly in industries and houses where gases are mostly to be found and gives an alert message when the system crosses threshold limit.

OVER VIEW:

Air contamination can be characterized as nearness of moment particulars that bothers the working of common procedures and furthermore creates unfortunate wellbeing impacts. In another way contamination can influence the characteristic periodicity and furthermore can irritate the wellbeing of person. As modernization and automation is becoming in all respects widely Pollution is likewise getting presented everywhere way. It has been seen that in mechanically creating or created nations human wellbeing get significantly influenced due to Air Pollution, where there is no framework to screen it or monitor it [1]. In late explores it has been demonstrated that there is a high connection batten's climatic toxins and maladies like asthma and lung related ailments. Air Pollution is currently a noteworthy worry over the globe and WHO has built up specific rules to confine the cutoff points of specific gases like O3, NO2, SO2 [2]. The Air Quality Index estimation and Pollution observing are mostly done AQM stations that are essentially exact and precise. They show ideal unwavering quality and viable in estimating a wide scope of air toxins. Be that as it may, even after every one of these stations slack fundamentally in three territories:

1) Infrastructure, essential for establishment as a result of the colossal size, 2) Operational necessities are basically mind boggling, 3) The common costs of setting up, day by day support and alignment. Thinking about the evil impacts of Pollution on people, in 2012, one out of eight of all out worldwide passings were brought about via air Pollution which was 7 million unexpected losses all around [3]. These passings were a consequence of various ailments, for example, ischemic coronary illness, interminable obstructive pneumonic sickness, stroke, lung malignant growth and intense lower respiratory diseases in youngsters [3]. The foundations for every one of those illnesses were related with outside and indoor air Pollution consolidated. Presently, in the event that one discussions about water Pollution, expending defiled water can prompt genuine medical problems in individuals and one may get influenced by hazardous waterborne ailments brought about by proto zoans, infections and microscopic organisms', for example, amoebiasis, hepatitis An, E coli and loose bowels. According to the WHO (world health association) these sicknesses have a portion of around 3.6% in the complete every day worldwide It right of ailments [4], and cause about 1.5 million human passings yearly. Additionally, commotion Pollution is likewise as unsafe as the other two sorts of Pollution as it might prompt hearing It takes, hypertension, ischemic coronary illness, irritation, and rest aggravation [5].

2. LITERATURE SURVEY

System Using Low Costand Energy Efficient Sensors. Mr.Vasim K. Ustad, Prof.A.S.Mali , Mr.SuhasS.Kibile, PG Student, Department of

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Electronics Engineering, Tatyasaheb Kore Institute of Engineering & Technology, Warananagar, Maharashtra, India. Air pollution is not only natural medical matters impact on creating nations alike. The strong effect of air pollution on wellbeing are extremely mind blowing as there are a broad area of sources and their particular influence differ from one another. The synthetic substances reason an assortment of mankind and natural medical issues enlarge in air contamination impacts on condition also on human wellbeing. To screen this contamination WSN framework is expressed. The proposed framework comprises of a Unit of Mobile-DAQ and a fixed Internet-Enabled contamination observation System. The Mobile-DAQ unit incorporates a solitary chip microcontroller, air pollution sensors exhibit, and GPS Device. The Pollution-Server is a top of the line individual computer application server with Internet network. The Mobile-DAQ unit assembles air toxins levels (CO, NO2, andSO2), and packs them in a casing with the GPS physic distribution, time, and date. The reason is to send the Pollution-Server by means of zig bee device. The pivotal-Server is interact to Google Maps to show the area of equipment. It can associate database server to the Pollution-Server for putting away the toxins range for future utilization by different user , for example, condition security offices, vehicles registration experts, and vacationer and insurance agencies. 2.Pollution Monitoring System utilizing WSN in Visakhapatnam P.VijnathaRaju, M.Tech Student R.V.R.S.Aravind, Associate Professor Nova school of Engineering and TechnologyJangareddigudem, W.G Distict, AP, India, Department of ECE ,Sanketika Institute of Technology and Management ,Visakhap'antnam, India. As the technology increases, the level of robotic work (cutting the labor) in the practically all parts are likewise increments. WSN are grabing up the ground in all divisions of life; from homes to industrial facilities, from traffic control to natural checking. The air pollution monitoring system contains sensors to screen the intrigued pollution parameter with regards to condition. It reenacted the three air contaminations gases including CO,CO2 and SO2 in air in light of the fact that these gases chooses the level of pollution. It can additionally apply the methodology in dissimilar house hold activities like spilling culinary gas in our homes, to caution the laborers in oil and gas sedulity to recognize the spillage and so on. This repetition makes the awareness in individuals in urban communities. 3. Wsn Based On Air Contamination Monitoring System In Metropolitan Cities The WSN based air contamination observing framework [3] depends on AVR ATmega-32 Microcontroller. The sensor network is utilized to distinguish the sensor esteems from various detectors as MQ5, MQ7, temperature and dampness particularity. ID3 calculation is utilized to ascertain the qualities contemptible on likelihood. Bluetooth device is utilized to interface the control with customer and the customer associates with the server by means of web administrations. This framework not just computes the pollution present noticeable all around yet in addition can make a figure to stay away from future contamination in the specific dirtied zone. Here they consider essentially the substance Industry close Pune and the I.T. zone like Hinjewadi.

The drawbacks of the conventional monitoring instruments are their large size, heavy weight and extraordinary expensiveness. These lead to sparse deployment of the monitoring stations. In order to be effective, the locations of the monitoring stations need careful placement because the air pollution situation in urban areas is highly related to human activities (e.g. construction activities) and location-dependent (e.g., the traffic choke-points have much worse air quality than average). IOT Based Air Pollution Monitoring System monitors the Air

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Quality over a webserver using internet and will trigger an alarm when the air quality goes down beyond a certain level, means when there are amount of harmful gases present in the air like CO2, smoke, alcohol, benzene, NH3, NOx and LPG. The system will show the air quality in PPM on the LCD and as well as on webpage so that it can be monitored very easily. Temperature and Humidity is detected and monitored in the system.

3. METHODOLOGY

EXISTING SYSTEM:

In the existing system, alcohol detectors are not proposed in any of the public transport, along with there is no any kind of Smoke detectors in the bus, hence there is a chance for anyone to drink and drive. Traffic police uses alcohol detectors to avoid drunk and drive system. Also, women safety is not maintained properly.

PROPOSED SYSTEM:

In a country like India, air pollution is increasing day by day at the alarming rate. The main reason for increasing of pollution level are crop's remaining burning, emission from the motor vehicle, open defecation of smoke in atmosphere from the industries and burning of garbage openly. Internet of Things (IoT) based pollution system is used to detect the current level of hazardous gases in the atmosphere. In our daily lives the quality of air determines the most because every human being needs fresh air to live. The IoT based pollution system will help us to fetch the data from any location where device is installed. All the data is visible in the smart phone app. In this project we have used the TELNET app. By using the concept of IoT we can use multiple pollution devices at different locations and fetch the data to the smart phone app.

OPERATION:

Proposed Air Pollution Monitoring System is based on the block diagram as shown in Fig.1. The data of air is recognized by MQ135 gas sensor and MQ6 LPG gas sensor. The MQ135 sensor can sense NH3, NOx, alcohol, Benzene, smoke, CO2. So it is dynamic gas sensored for our Air pollution Monitoring system. When it will be connected to Arduino then it will sense all gases, and it will give the Pollution level in PPM (parts per million). MQ135 gas sensor will give the output in form of voltage levels and we have to convert it into PPM. So for converting the output in PPM, we have used a library for MQ135 gas sensor and MQ6 sensor. Sensor is giving us value of 90 when there is no gas near it and the air quality safe level is 350 PPM and it should not exceed 1000 PPM. When it will exceed the limit of 1000 PPM, it will cause Headaches, sleepiness and stagnant, stuffy air. If it exceeds beyond 2000 PPM then it will cause increased heart rate and many different diseases. When the value will be less than 1000 PPM, then the LCD and webpage will display "Fresh Air". When the value will increase from 1000 PPM, then the buzzer will start beeping and the LCD and webpage will display "Poor Air, Open Windows". And when it will increase 2000, the buzzer will keep beeping and give an alert message on smartphone through WIFI. The LCD and webpage will display "Danger! Move to fresh Air". It will contain temperature and humidity so it will possibly show the current temperature and humidity of the air. For temperature we have used LM35 sensor and for humidity SY-HS-220.

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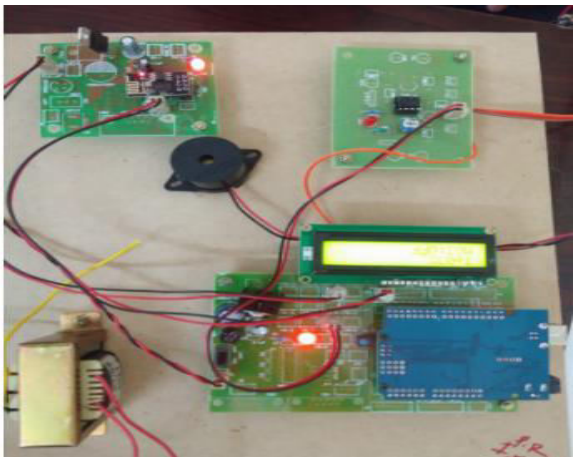

Fig.1. Hardware kit image.

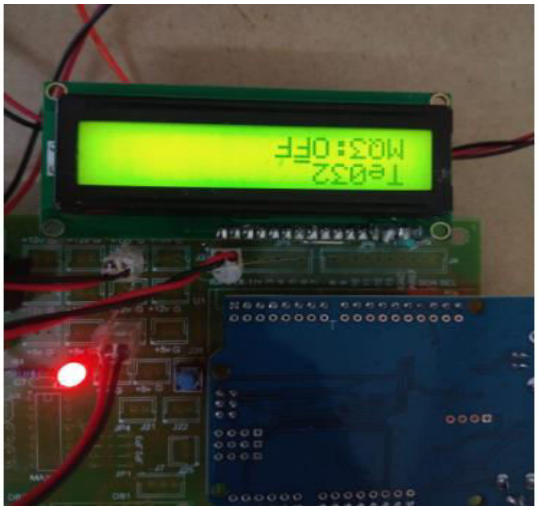

Fig.2. LCD display parameters.

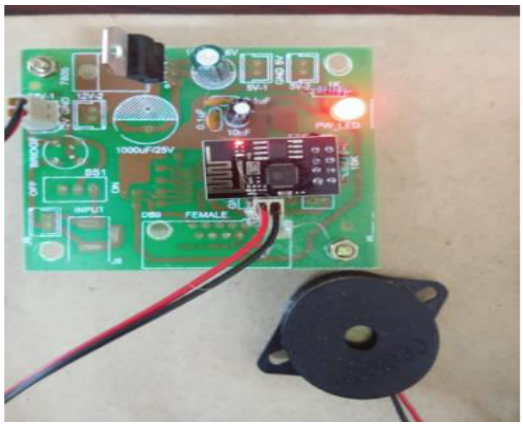

Fig.3. WIFI module.

CONCLUSION

The proposed IoT based air pollution system is a good device to measure the air quality in outdoors and indoors. This device can be useful to measure the level of gases in a highly dense area like markets hospitals, railway station, bus stand etc from the remote-control room. If data is stored, we can use the data for further experiments which can conclude a significant result. This system is IoT based so it can be used in the smart home for the purpose of cooling, ventilation and other purposes. IoT will enhance the artificial intelligence in the world, so the system can be used in automated systems in factories and industries. This device can be used to understand the flow of wind in different condition and can be helpful to understand their effects on the environment and human life. These systems can become very helpful for the society as the respiratory health conditions are increasing day by day. Due to their high sensitivity these systems can be used in chemical industries. These can be also used by defence agencies to detect any chemical attack. The efficiency of these instruments can be increase by attaching the number of sensor to it. Due to the compatibility to multiple sensors the use of system will be also increased. In early stage meter is powered by the source, but it can be powered by the solar power. In metropolitan cities system can be fitted on the top of the traffic signals due to their compact design. A number of systems can be operated from one control room, without any special arrangement.

FUTURE SCOPE:

The system to monitor the air of environment using Arduino microcontroller, IOT Technology is proposed to improve quality of air. With the use of IOT technology enhances the process of monitoring various aspects of environment such as air quality monitoring issue proposed in this paper. Here the using of MQ135 gas sensor gives the sense of different type of dangerous gas and

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arduino is the heart of this project which controls the entire process. Wi-Fi module connects the whole process to internet and LCD is used for the visual Output. The Automatic Air & Sound management system is a step forward to contribute a solution to the biggest threat. The air & sound monitoring system overcomes the problem of the highly-polluted areas which is a major issue. It supports the new technology and effectively supports the healthy life concept. This system has features for the people to monitor the amount of pollution on their mobile phones using the application.

REFERANCES

[1] Ghareeb, M., Bazzi, A., Raad, M., & AbdulNabi, S, "Wireless robo-Pi landmine detection. In Landmine: Detection, Clearance and Legislations (LDCL)," 2017 First International Conference on (pp. 1-5). IEEE, April 2017.

[2] Craig, J. J., "Introduction to robotics: mechanics and control," Upper Saddle River, NJ, USA: Pearson/Prentice Hall, Vol. 3, pp. 48-70, 2005.

[3] Olley, G. S., and Pakes, A., "The dynamics of productivity in the telecommunications equipment industry" (No. w3977). National Bureau of Economic Research, 1992.

[4] Li, Shelei, Xueyong Ding, and Tingting Yang. "Analysis of Five Typical Localization Algorithms for Wireless Sensor Networks." Wireless Sensor Network 7.04: 27, 2015.

[5] Magrabi F, Aarts J, Nohr C, et al., "A comparative review of patient safety initiatives for national Health information technology," Int J Med Inform; 82:e139–48, 2013.

[6] Pugh, J., and Martinoli, A., "Inspiring and modeling multi-robot search with particle swarm optimization," In Swarm Intelligence Symposium, 2007. SIS 2007. IEEE (pp. 332-339). IEEE, April 2007.

[7] Rjeib, H. D., Ali, N. S., Al Farawn, A., Al-Sadawi, B., and Alsharqi, H., "Attendance and Information System using RFID and Web-Based Application for Academic Sector," International Journal of Advanced Computer Science and Applications (IJACSA), 9(1). 2018.

[8] Suresh, K., Vidyasagar, K., and Basha, A. F., "Multi Directional Conductive Metal Detection Robot Control. International Journal of Computer Applications, 109(4), 2015.

[9] Ambruš, D., Vasić, D., and Bilas, V., "Robust estimation of metal target shape using time-domain electromagnetic induction data," IEEE Transactions on Instrumentation and Measurement, 65(4), 795-807, 2016.

[10] Albert, F. Y. C., Mason, C. H. S., Kiing, C. K. J., Ee, K. S., and Chan, K. W., "Remotely operated solar-powered mobile metal detector robot," Procedia computer science, 42, 232-239, 2014.

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GENETIC ALGORITHM BASED GENERATION CONTROL WITH SUPERCONDUCTING MAGNETIC STORAGE

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Abstract- This paper discusses the effect of a Superconducting Magnetic Energy Storage (SMES) on low frequency oscillations in area frequency deviations and the tie line power variations following a step load perturbation. A two area interconnected thermal power system with two reheat generating units in area and two non-reheat generating units in area has been considered with SMES unit in each area. The optimal integral gain settings of both the areas without and with SMES are obtained for different combinations of ACE participation factors using Genetic Algorithm where the objective function considered is quadratic in frequency deviations and tie line power deviations.
Keywords:-Automatic Generation Control, Genetic Algorithm.

1. INTRODUCTION

Automatic Generation Control (AGC) has been one of the most debated topics ever since the operation of interconnected power systems began. One of the main tasks involved in reliable and efficient interconnected power system operation is to maintain the interchanged power and the system frequency at their respective scheduled values so that the power system remains at its nominal state characterized by nominal system frequency, voltage profile and load flow configuration. For this, the generated power should instantaneously match the demanded power and associated power losses. Since the load is continuously changing, it is practically impossible to attain perfect power generation-consumption equilibrium and the resulting mismatch is reflected as deviations in system frequency and tie line power flows from their respective scheduled values.

Relatively close control of frequency ensures constancy of speed of induction and synchronous motors. Constancy of speed of motors drives is particularly important for satisfactory performance of generating units as they are highly dependent on the performance of all the associated auxiliary drives. Thus AGC of an interconnected

power system is concerned with two main objectives: instantaneously matching the generation to the system load and adjusting the system frequency and tie line loadings at their scheduled values as close as possible so that, the quality of the power delivered is maintained at requisite level. A review of literature shows that most of the works concerned with AGC pertain to tie line power control strategy. This is realized by regulating the area control errors to zero using supplementary control. Integral controllers have been used for the supplementary control in AGC.

Even in the case of small load disturbances and with the optimized gain for the supplementary controllers, the power frequency and tie line power deviations persist for a long duration. In these situations, the governor system may no longer be able to absorb the frequency fluctuations due to its slow response. Thus a limit is imposed on the degree to which frequency deviations and tie line power deviations can be minimized, since the inertia of the rotating parts is the only energy storage capacity in a power system. To compensate for the sudden load changes, an active power source with fast response such as a Superconducting Magnetic Energy Storage (SMES) unit is expected to be the most effective countermeasure. Thus SMES can improve power quality and improve system operation in terms of frequency regulation, reduction of area control error and inadvertent tie line flow. Compared with other active energy sources, SMES has inherent advantages that it has fast response in the range of milliseconds and it acts almost as a lossless storage device.

No energy conversion is needed and so higher efficiency is ensured. These systems are capable of providing instantaneous reserves for rapidly changing loads and can effectively reduce the frequency deviations and tie line power deviations due to small load disturbances. Oscillations in frequency deviations and tie line power deviations are also damped out. SMES also has other applications in power systems like system stability improvement, spinning reserve, VAR control, power quality improvement etc. Owing to the developments in computer technologies and recent development of parallel computing environments, Genetic Algorithms (GA) are emerging as powerful alternatives to traditional optimization methods which are CPU intensive. GA is one of the most advanced forms of evolutionary computation techniques which have been highly successful for getting computers to automatically solve problems without having to tell them explicitly how. GA's are global search algorithms based on the

natural law of evolution of species by natural selection.

Few fundamental characteristics that make GA versatile, flexible and applicable to a wide range of optimization problems are that, GA's are blind search methods which uses information only about objective function, they are parallel search schemes which simultaneously evaluate many points in the parameter space rather than a single point, they work directly with bit strings representing the parameter sets and not the parameter themselves etc. In view of the above, this paper aims to investigate the effect of SMES units on the dynamic performances of an interconnected thermal power system following a step load disturbance in either of the areas. For different ACE participation factors, the optimum values of integral gain settings in the control areas without and with SMES units are obtained using Genetic algorithms.

2. AGC SYSTEM MODEL STUDIED

A two area interconnected power system has been considered for the present work. Area 1 consists of two reheat generating units and area 2 consists of two non-reheat generating units. In either of the areas, both generators are assumed to form a coherent group. A schematic of the power system under analysis.

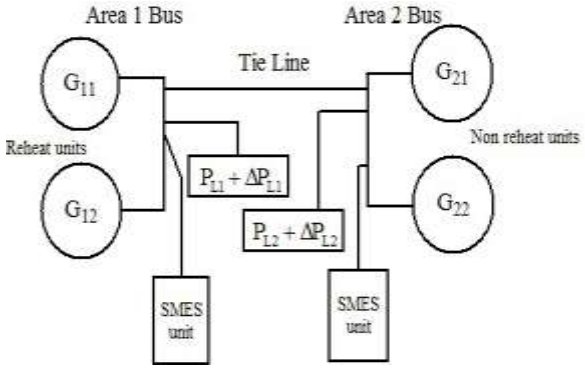

Fig. 1 Schematic of two area power system

Since thermal units are subjected to thermodynamic and mechanical stresses, there is a limit to the rate at which the turbine output can be changed. This limit is termed as generation rate constraint and a limit of 3% per minute for reheat units and 10% per minute for non-reheat units are considered. Supplementary integral control is the conventional control employed in each area to minimize the respective area control error to zero thereby reducing the frequency deviations and tie line power deviations. The input to the integral controller in each area is the respective Area Control Error

(ACE) signal, which is a linear combination of the frequency perturbation and tie-line power deviation.

Since small load perturbations are considered in the AGC problem, a small perturbation transfer function model is being used for the studies. The two areas are interconnected by tie line and the load demands are to be shared by the two units in each of the areas according to their respective ACE participation factors. Apf11 and apf 12 are the ACE participation factors in area 1 whereas apf21 and apf22 are the ACE participation factors in area 2. In area 1, apf11 + apf12 = 1 and in area 2, apf21 + apf22 = 1. Small capacity SMES units are connected in each of the areas. A step load disturbance of 1% in either of the areas has been considered for the investigations.

3. SUPER CONDUCTING MAGNETIC ENERGY STORAGE UNIT

SMES is a technology based on the ability of superconductors to carry high dc currents with no resistive loss in the presence of significant magnetic fields, thereby directly storing electrical energy. Its advantage is that it is capable of providing instantaneous supply or demand of power. SMES units consist of a dc magnetic coil kept in superconducting medium, a power conditioning system and the control circuit. The inductor coil conducts with virtually zero losses as the heat generated is transferred to the refrigerating medium, usually liquid helium. An alloy of niobium and titanium is usually used for the super conducting coil. Low temperatures at the ranges of 4 to 10K are maintained by the refrigerant. Hence energy will be stored as magnetic field provided by the circulating current in the coil.

The circuit diagram of SMES in which a dc magnetic coil is connected to ac grid through a power conversion system (PCS) which includes an inverter/ rectifier. Power conversion system is used for the energy exchange between SMES coil and the ac grid and it has a wye-delta connected transformer arrangement and a 12-pulse line commutated converter. The energy exchange between the superconducting coil and the electric power system is controlled by the line commutated converter. The particular transformer arrangement and higher pulse number of the converter circuit ensures harmonics being intruded into the ac grid are reduced. The voltage across the inductor can be varied over a range of positive and negative values by varying the firing angle of SCR's from 00 to 1800.

The current circulates in the coil virtually without losses as it is kept in the cryogenic medium.

Hence energy is stored as magnetic field in the SMES coil. The coil is now ready for its intended function in the power system to which it is linked through the power conditioning system. When there is a sudden power demand in the power system, it is met by the action of governing system which increases the mechanical power input accordingly. These conventional control actions take seconds to complete. As an SMES coil is augmented with the power system, the power demand is instantaneously supplied from its stored energy before the governor control comes into play. Similarly, for excess power in the system, it will be absorbed by the SMES coil. As the conventional governor control actions dominate after few seconds, the SMES coil gets charged or discharged to its previously set value. When $\alpha < 900$, converter acts in converter mode (charging mode) and when $\alpha > 900$, converter acts in inverter mode (discharging mode).

4. SMES CONTROL STRATEGY

For a sudden load demand, the frequency will fall resulting in a negative value of frequency deviation. This will reflect as a negative voltage across the coil and hence the required energy will be discharged to the ac grid. For excess power in the system, a positive voltage will be impressed across the inductor and energy will be absorbed from the ac grid. Frequency deviation is taken as the control signal for SMES unit in the area.

5. INDUCTOR CURRENT DEVIATION FEEDBACKS

The natural restoration of inductor current to its rated value is a slow process and the rate of current restoration has to be improved by alternate methods. The inductor current has to be restored to its rated value quickly as possible such that it can respond to the next load disturbance effectively. To improve the current restoration rate to its steady state value, a feedback loop is employed in the SMES control loop by applying a negative feedback with inductor current deviation signal. The incremental change in inductor voltage is then,

6. GENETIC ALGORITHM OPTIMIZED INTEGRAL GAIN SETTINGS

The efficiency of supplementary control is determined by the optimal integral gain settings Ki1 and Ki2 of area 1 and area 2 respectively. The optimum values of integral gains are obtained using genetic algorithm (GA). An initial population of gain values is first created which are coded as bit strings called chromosomes. Each of these chromosomes represents a possible solution of optimization. GA operations such as selection, crossover and mutation are performed on the population. GA

searches not on single points as in traditional optimization methods but many points in the search space. In each iteration, fitness value of each individual is calculated and the best parents are selected.

These parents are combined with each other (crossover) or within themselves (mutation) to produce offspring's for the next generation. As the number of generations advances, the program evolves to an optimal solution. The algorithm gets stopped when the prescribed stopping criteria is met. The schematic of genetic algorithm in AGC problem is an objective function based on the Integral Square Error technique is considered and the corresponding performance index is minimized for 1% step load disturbance in either of the areas keeping the other area uncontrolled following the approach.

7. DYNAMIC RESPONSES AND DISCUSSION

Simulations are carried out in Mat lab/Simulink version 7.6 environment to obtain the dynamic responses of the interconnected power system following 1% step load disturbance in either of the control areas. The genetic algorithm options considered for simulation in this work are: Number of generations: 100, Population size: 50, Selection: Roulette wheel, Crossover: Single point, Mutation: Gaussian, Crossover probability: 0.98 and Elite count: 2. The plot of fitness value versus number of generations for the integral gain setting Ki1 of area 1 without SMES units. It implies that as the number of generation proceeds, the fitness value gets reduced and then reaches 0.07265, the minimum value of the performance index towards the end. It is observed that SMES units considerably reduce the peak overshoots and settling times of these responses.

Owing to its fast response, SMES units meet the sudden load perturbations even before governor control actions come into play. This fast response of the SMES units is reflected in the plots showing deviations in frequency and interchanged power. It is also seen from that the oscillations in frequency deviations in area1 and area 2 are damped out with the inclusion of SMES units. The low frequency oscillations in tie-line power deviation due to sudden load disturbance have also been suppressed effectively.

8. CONCLUSION

A small perturbation transfer function model of a two area interconnected thermal system has been modelled with a small capacity SMES unit incorporated into each area. A realistic nonlinearity constraint, generation rate constraint is also included in both the areas. A 1% step load

disturbance in either of the areas has been considered for simulation. The integral gain settings were optimized using genetic algorithm considering an objective function based on integral square error criterion. Integral gain settings for different ACE participation factors with and without SMES units have been found. Simulation results reveal that with SMES, the dynamic responses have been improved in terms of overshoots and settling time when compared with those without SMES units.

REFERENCES:

1. O. I. Elgerd, C. E. Fosha, Optimum megawatt frequency – control of multi-area electric energy systems, IEEE Transactions on Power Systems, PAS-89, 1970, pp. 556-563.
2. C. E. Fosha, O. I. Elgerd, The megawatt frequency – control problem: A new approach via optimal control theory, IEEE Transactions on Power Systems, PAS-89, 1970, pp. 563-577.
3. K. S. S. Ramakrishna, T.S. Bhatti, Automatic generation control of single area power system with multi-source power generation, Proc. IMechE., Part A: J. Power and Energy, 222, (1) , 2008, pp. 1-11.
4. H. Shayeghi, H. A. Shayanfar, and A. Jalili, Load frequency control strategies: A state-of-the-art survey for the researcher, Energy Conversion and Management, 50, 2009, pp. 344-353.
5. Ibraheem, P. Kumar, and D. P. Kothari, Recent philosophies of automatic generation control strategies in power systems, IEEE Transactions on Power Systems, 20, (1), 2005, pp. 346-357.
6. S. Doola, T. S. Bhatti, A new load frequency control technique for an isolated small hydro power plant, Proc. IMechE., Part A: J. Power and Energy, 221, (1) , 2008, pp. 51-57.
7. J. Nanda, M. L. Kothari, P. S. Satsangi, Automatic generation control of an interconnected hydrothermal system in continuous and discrete modes considering generation rate constraints, IEE Proc., 130, (1) , 1983, pp. 17-27.
8. J. Nanda, M. L. Kothari, P. S. Satsangi, Sampled-data Automatic Generation Control of interconnected reheat thermal systems considering generation rate constraints, IEEE Transactions on Power Apparatus and Systems, 100, (5) , 1981, pp. 2334-2342.
9. M. Aldeen, H. Trinh, Load frequency control of interconnected power systems via constrained feedback control schemes, ComputElectr Eng., 20, (1) 1994, pp. 71-88,.
10. J. Nanda, B. L. Kaul, Automatic generation control of an interconnected power system, Proc. IEE., 125, (5), 1978, pp. 385-390.

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IMPLEMENTATION OF VIRAL SYSTEM ALGORITHM IN LOAD BALANCING OF CLOUD SYSTEM

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Abstract- As the cloud computing technology is gaining popularity with time, more and ore users and applications are shifting towards it. This is why clouds are experiencing high load, which demands for load balancing of user tasks submitted to cloud for execution. This makes load balancing of non-preemptive tasks a key issue in cloud computing. Superior task scheduling leads to balanced loads among cloud nodes, which results in faster execution of tasks. Task scheduling in cloud environment is an instance of NP-hard optimization problem.
Keywords: Viral System Algorithm, Cloud Computing, Load Balancing, Task Scheduling.

1. INTRODUCTION

Now-a-days one of the fastest emerging fields in information technology is cloud computing, also referred to as simply "the cloud," which delivers on-demand computing resources ncluding everything from platform and applications, to data centers over internet on a payfor- use basis. It is entirely an internet-based approach where all the resources are placed on a cloud consisting number of high speed interlinked computers for serving the incoming requests from connected clients. Under this technology, clients can use computational power, software services and platform offered by cloud service providers while paying only for duration those resources have been accessed. This forces the conventional software licensing policies to change and avoids spending of money for the facilities the client does not use in a software package (Dhinesh Babu and Venkata Krishna, 2013).

On the basis of architecture, cloud computing can be divided into three layers: Application layer, platform layer and infrastructure layer. NIST has defined three service models that a cloud service provider can provide to consumers which are Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a

Service (IaaS). SaaS makes applications running on a cloud infrastructure accessible to consumers. PaaS makes consumer created or acquired applications deployable onto cloud infrastructure. IaaS provides provision for processing, storage, networks and other fundamental computing resources where the consumer is able to deploy and run software, which can include operating systems and other applications. On the other hand, there are three commonly-used cloud deployment models: private, public and hybrid. An additional, lesscommonly used model is community cloud. A private cloud is meant for a single organization where software such as VMWare, vCloud Director, or OpenStack can be used. A public cloud is a set of computing resources provided by third-party organizations like Amazon Web Services, Google AppEngine and Microsoft Azure. A hybrid cloud is a mixture of computing resources provided by both private and public clouds. A community cloud shares computing resources across several organizations.

These days, most of us are using cloud services directly or indirectly. From email systems, social networking websites to mobile chatting apps for connecting people to each other are running on cloud. According to research and advisory consultancies including International Data Corporation (IDC), global SaaS market is projected to grow from $49B in 2015 to $67B in 2018, attaining a CAGR of 8.14%. It also states that global spending on IaaS is expected to reach $16.5B this year, an increase of 32.8% from 2014 and cloud applications will account for 90% of worldwide mobile data traffic by 2019, which was 81% in the end of 2014.

A client expects a high quality of service and therefore strives to find a reliable and fast cloud service that falls under the budget. In order to meet these expectations, it is essential for cloud service provider to utilize available resources optimally. For increasing efficiency and capabilities of cloud, virtualization is performed which refers to creating multiple virtual versions of resources, known as Virtual Machines (VMs) within a host. It enables same set of resources available in one or more execution environments. VMs should complete the execution of user submitted tasks as fast as possible. At the same time, one VM may experience overload whereas other may see under loaded condition. Such improper utilization of resources results into longer execution time and waiting time leaving the clients disappointed.

To avoid above situation, a scheduler (also known as load balancer) is used, which receives all the tasks incoming from clients for execution, keeps them in a queue, applies a task scheduling algorithm to determine best possible set of VMs for executing those tasks and finally assigns the tasks across VMs for execution. A scheduler works as good as its scheduling algorithm is and it can significantly improve execution time by optimizing the utilization of cloud resources. Since billions of users can be accessing a cloud at a time therefore it requires a large scale task scheduling algorithm. Since performance of a cloud depends upon how scheduling of tasks is performed therefore it makes task scheduling one of the major concern that needs to be addressed in this area.

In this study, we propose a viral system based loadbalancing (VSB-LB) algorithm for scheduling independent heterogeneous tasks in cloud environment and reducing the execution time of tasks. Rest of the paper is organized as follow: Section-2 presents related works, section-3 discusses basics concepts of viral system algorithm, section-4 explains the proposed load balancing model based on viral system behavior, section- 5 discusses about the behavior and performance of proposed model, section-6 finally concludes the paper.

1.1 Related Work

During the last decade, rapid increase in number of cloud users has caught the attention of researchers from all round the globe. Recently a large variety of task scheduling and load balancing algorithms have been introduced, which are briefly discussed in this section.

In the past few years, researchers around the globe have proposed a variety of solutions to perform task scheduling and load balancing in cloud. Subramanian et al. (2012) used dynamic priority for scheduling virtual machines. Paul and Sanyal, (2011) used credit based scheduling decision for evaluating group of task in the task queue and find the minimal completion time of all task. Zhao and Huang (2009) reduced the migration time of virtual machines through shared storage and fulfilling the zero-downtime relocation of virtual machines by transforming them as Red Hat cluster services. Li et al. (2011) proposed a hybrid energy-efficient scheduling algorithm using dynamic migration that not only reduces response time but also conserves energy besides achieving load balancing. Mondal et al. (2012) used a local optimization stochastic hill climbing approach for allocating incoming jobs to virtual machines whereas Wadhwa et al. (2015) proposed a scheduling that aims to

improve QoS by minimizing the waiting time.

Fang et al. (2010) proposed a two levels task scheduling mechanism for load balancing in cloud computing. It not only meets user's requirements, but also leads to high resource utilization. The first level scheduling is performed at application layer to the virtual machine and second is from virtual machine to host resources. The performance of this technique can be improved by taking more parameters into account such as bandwidth, cost etc.

Bitam et al. (2012) applied population based meta heuristic Bees Life Algorithm (BLA) to solve the job scheduling problem in cloud. It improves the efficiency and the performance in terms of execution time.

Xu et al. (2013) proposed a cloud partitioning based load balancing conceptual framework for a large public cloud. It creates separate load balancer for each partition, all of which are controlled by a main controller. At first, the controller chooses right partition according to partition status that can be either idle, normal or overload. Once the partition is chosen, the load balancer of that partition applies an appropriate load balancing strategy to choose best suitable node within the partition to execute the task.

This framework does not consider many practical aspects and its feasibility is not yet assessed. Dhinesh Babu and Venkata Krishna (2013) proposed an algorithm for load balancing of tasks, which is completely inspired by natural foraging behavior of honey bees, which adopt to find and reap food. In bee hives, scout bees forage for food sources and upon finding one, they come back to the beehive and advertise it by a waggle/tremble/vibration dance that gives the idea about the quality and/or quantity of food and its distance from the beehive. Forager bees then follow scout bees to that location and begin to reap it.

They then return to beehive and do same before other bees in the hive giving an idea of how much food is left and hence resulting in either more exploitation or abandonment of the food source. In the same manner, removed tasks from over loaded VMs are considered analogous to honey bees. Upon submission to the under loaded VM, the task updates the number of various priority tasks and load of that particular VM to all other waiting tasks. It helps other tasks in choosing their virtual machine based on load and priorities.

Dasgupta et al. (2013) proposed a genetic algorithm based load balancing technique for improving the response time. The

three major operations involved are selection, genetic operation and replacement. Authors claim that it can handle a vast search space, applicable to complex objective function and can avoid being trapped in local optimal solution. However the cost function includes only two parameters i.e., number of instructions in task and MIPS of VM under consideration, which can be improved by considering other valuable parameters such as load difference among VMs etc.

Zhan et al. (2014) tried to solve the task scheduling problem in cloud computing by using a Load balance Aware Genetic Algorithm (LAGA) with Min-min and Max-min methods. It introduced the Time Load Balance (TLB) model and provided interaction between makespan and TLB that helps the algorithm to minimize the makespan. The Min-min and Max-min methods were used to find promising individuals at the beginning of evolution leading to a noticeable improvement of evolution efficiency. The n × m task scheduling problem was represented by corresponding.

Resource-Task Model and the characteristics of the problem were described using matrix called Expected Time of Completion containing the completion time of each task with each resource. Another matrix Expected Scheduling to Compute (ESC) describes a solution to task scheduling problem by recording the matching of tasks and resources.

A Hybrid Artificial Bee and Ant Colony optimization (H_BAC) load balancing algorithm is proposed in (Gamal et al., 2017). It inherits the main behaviors of both ACO and ABC algorithms and takes into consideration monitoring the load of Virtual machines (VMs) and the decision of load balancing before scheduling tasks in VMs. The authors claim that it uses two constraints in order to select the most suitable VM and guarantee the load balancing of the system.

An evolutionary algorithm for scheduling tasks in Cloud computing is proposed in (Navimipour and Milani, 2015). It is based on the obligate brood parasitic behavior of some cuckoo species in combination with the Lévy flight behavior of some birds and fruit flies and
focuses on minimizing the total waiting time of tasks. The downside of their work is that it is applicable only for homogeneous cloud infrastructure.

Domanal et al. (2017), authors have proposed three different Bio-Inspired algorithms for efficient scheduling and resource management in a cloud environment. The MPSO algorithm was found more efficient in scheduling the tasks as compared

to other algorithms. On the other hand, the proposed HYBRID (MPSO + MCSO) approach was more effective in allocating the resources to VMs when compared to other algorithms. The proposed HYBRID algorithm not only reduced the average response time but also increased resource utilization by 12% when compared to other state-of-the-art benchmark algorithms.

Most existing systems consider only two resources i.e., CPU and memory, while evaluating their performance. In (Gawali and Shinde, 2018), authors proposed a heuristic algorithm that performs task scheduling and allocates resources efficiently in cloud computing environments.

They used real Cybershake and Epigenomics scientific workflows as input tasks for the system and have also considered the bandwidth as a resource. Their heuristic approach gives improved results as compared to existing BATS and IDEA frameworks with respect to turnaround time and response time. On the other hand, proposed heuristic approach efficiently allocates resources with high utility.

1.2 Viral System Behavior

Viral System Algorithm (VSA) is a relatively new bio inspired algorithm based on viral infection process. It was originally proposed in (Cortés et al., 2012). VSA consists of two basic operations namely replication and infection. A Viral System (VS) consists of following three components:

2 MODELING OF VIRAL SYSTEM BASED LOAD BALANCING

The clinical picture contains a number of cells where each cell or genome is represented using resource task model as described in (Zhan et al., 2014). According to this model, if there are n tasks to be assigned among m virtual machines then ith cell (Ci) is represented as shown in Fig. 1.

Where, Cik is an integer value representing the index number of virtual machine on which the kth task in ith chromosome is scheduled to execute. The length of a cell is equal to the number of available tasks and Ci represents a possible distribution of tasks across available VMs. This whole distribution is one possible solution from numerous solutions in solution space.

The cells in clinical picture repeatedly undergo infections massively or selectively according to Viral System algorithm.

As Fig. 2 depicts, the clinical picture contains a fixed number of cells. The ith cell is represented as Ci where $1 \leq i \leq$ Size of clinical picture. With each cell, expected time to complete (ETC) and load difference (LD) is associated. The term ETCi and LDi denotes the

expected time duration to complete the execution of all tasks and the load difference among all the VMs respectively in ith solution. Smaller values of ETC and LD are desired i.e. smaller the values of ETCi and Ldi better is the solution represented by cell Ci.

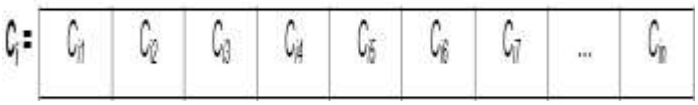

Fig. 1: Cell representation in resource task model

Clinical Picture			
S.No.	C	ETC	LD
1.	C_1	ETC_1	LD_1
2.	C_2	ETC_2	LD_2
.	.	.	.
.	.	.	.
Size.	C_{Size}	ETC_{Size}	LD_{Size}

Fig. 2: Clinical picture representation

3. CONCLUSION

In this study a bio inspired viral system based load balancing technique for cloud computing environment is proposed. The goal of this paper is to enable the reader how viral ystem can be applied for performing load balancing in cloud. The algorithm distributes alanced load among the nodes and reduces execution time of user submitted tasks. Simulation results have revealed a significant improvement in distributed load and total execution time of tasks as compared to FCFS and WRR. It is also seen that viral system based load balancing,j is slightly better than genetic algorithm when applied in cloud computing environment, which may be a motivating fact for further research in this field

REFERENCES

1. Bitam, S., 2012. Bees life algorithm for job scheduling in cloud computing. Proceedings of the ICCIT, (CIT' 12), pp: 186-191.
2. Calheiros, R.N., R. Ranjan, A. Beloglazov, C.A.F. De Rose and R. Buyya, 2011. CloudSim: A toolkit for modeling and simulation of cloud computing environments and evaluation of resource provisioning algorithms. Software Pract. Exp., 41: 23-50. DOI: 10.1002/spe.995
3. Cortés, P., J.M. García, J. Muñuzuri and J. Guadix, 2010. A viral system massive infection algorithm to solve the Steiner tree problem in graphs with medium terminal density. Int. J. Bio-Inspired Comput., 2: 71-77. DOI: 10.1504/IJBIC.2010.032123
4. Cortés, P., J.M. García, J. Muñuzuri and J. Guadix, 2012. Viral system algorithm: Foundations and comparison between selective and

massive infections. Trans. Inst. Measurement Control, 34: 677-690. DOI: 10.1177/0142331211402897

5. Dasgupta, K., B. Mandal, P. Dutta, J.K. Mondal and S. Dam, 2013. A Genetic Algorithm (GA) based Load balancing strategy for cloud computing. Proc. Technol., 10: 340-347. DOI: 10.1016/j.protcy.2013.12.369
6. Dhinesh Babu, L.D. and P. Venkata Krishna, 2013. Honey bee behavior inspired load balancing of tasks in cloud computing environments. Applied Soft Comput., 13: 2292-2303. DOI: 10.1016/j.asoc.2013.01.025
7. Domanal, S., R.M.R. Guddeti and R. Buyya, 2017. A hybrid bio-inspired algorithm for scheduling and resource management in cloud environment. IEEE Trans. Services Comput. DOI: 10.1109/TSC.2017.2679738
8. Fang, Y., F. Wang and J. Ge, 2010. A task scheduling algorithm based on load balancing in cloud computing. Proceedings of the International Conference on Web Information Systems and Mining, Oct. 23-24, Springer, Sanya, China, pp: 271-277. DOI: 10.1007/978-3-642-16515-3_34
9. Gamal, M., R. Rizk, H. Mahdi and B. Elhady, 2017. Bioinspired load balancing algorithm in cloud computing. Proceedings of the International Conference on Advanced Intelligent Systems and Informatics, (ISI' 17), Springer, Cham, pp: 579-589. DOI: 10.1007/978-3-319-64861-3_54
10. Gawali, M.B. and S.K. Shinde, 2018. Task scheduling and resource allocation in cloud computing using a heuristic approach. J. Cloud Comput., 7: 4-4. DOI: 10.1186/s13677-018-0105-8
11. Li, J., J. Peng and W. Zhang, 2011. A scheduling algorithm for private clouds. J. Convergence Inform. Technol., 6: 1-9. DOI: 10.4156/jcit.vol6.issue7.1
12. Mondal, B., K. Dasgupta and P. Dutta, 2012. Load balancing in cloud computing using stochastic hill climbing-a soft computing approach. Proc. Technol., 4: 783-789. DOI: 10.1016/j.protcy.2012.05.128
13. Navimipour, N.J. and F.S. Milani, 2015. Task scheduling in the cloud computing based on the cuckoo search algorithm. Int. J. Model. Optimiz., 5: 44-47. DOI: 10.7763/IJMO.2015.V5.434
14. Paul, M. and G. Sanyal, 2011. Task-scheduling in cloud computing using credit based assignment problem. IJCSE, 3: 3426-3430.
15. Subramanian, S., G. Nitish Krishna, M. Kiran Kumar, P. Sreesh and G.R. Karpagam, 2012. An adaptive algorithm for dynamic priority based virtual machine scheduling in cloud. IJCSI, 9: 397-402.
16. Wadhwa, S., M. Jain and B. Pandey, 2015. Design and implementation of scheduling algorithm for high performance cloud computing. Int. J. Web Sci. Eng., 2: 15-20. DOI: 10.21742/ijwsesd.2015.2.1.02
17. Xu, G., J. Pang and X. Fu, 2013. A load balancing model based on cloud partitioning for the public cloud. Tsinghua Sci. Technol., 18: 34-39. DOI: 10.1109/TST.2013.6449405
18. Zhan, Z.H., G.Y. Zhang, Ying-Lin, Y.J. Gong and J. Zhang, 2014. Load balance aware genetic algorithm for task scheduling in cloud computing. Proceedings of the 10th International Conference on Simulated Evolution and Learning, Dec. 15-18, Springer, Dunedin, New Zealand, pp: 644-655. DOI: 10.1007/978-3-319-13563-2_54
19. Zhao, Y. and W. Huang, 2009. Adaptive distributed load balancing

algorithm based on live migration of virtual machines in cloud. Proceedings of the 5th International Joint Conference on INC, IMS and IDC, Aug. 25-27, IEEE Xplore Press, Seoul, South Korea, pp: 170-176. DOI: 10.1109/NCM.2009.350

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AGILE SOFTWARE DEVELOPMENT: A STUDY

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Abstract- This paper provides a better understanding of the architecture related issues in agile development and proposes a model to guide and assist practitioners adopting agile requirements engineering. The methodology was motivated by the lack of structure to the agile requirements engineering process with minimal impact on agility. It describes in detail the phases of the agile requirements engineering process and suggests techniques that can be used to perform these phases.
Keywords: Architecture Challenges in Agile Environment.

1 INTRODUCTION

The conventional approach to the RE process focuses on gathering all the requirements and preparing the requirements specification document up front before proceeding to the design phase. These upfront requirements gathering and specification efforts consume a long time and leave no room to accommodate changing requirements later in the development cycle. Some of the issues faced by organizations involved in upfront requirements gathering and specification efforts are [8]: Requirements change over a period of time due to changes in customer and user needs, technological advancement and schedule constraints. Identifying new requirements or changing existing requirements affects the other requirements as new dependencies may surface. Also, changes to requirements involve modifying the architecture and in turn, the code. Accommodating changing requirements is an expensive activity. Hence, gathering all the requirements up front is expensive in the face of rapidly changing requirements. Also, new requirements can be identified late in the development cycle. Requirements Management activities help plan for and control change. However, it is not always possible to avoid changes to requirements.

Rapidly changing business environments can cause requirements to become obsolete before project completion. On the other hand, the agile requirements engineering [8] welcomes changing requirements even late in the

development cycle. This is achieved by using the agile practice of evolutionary requirements which suggests that requirements evolve over the course of many iterations rather than being gathered and specified up front. Agile requirements engineering has the following issues: (i) Clear specification of activities in the agile requirements engineering process is missing and there is a lack of a set of techniques that practitioners can choose from, (ii)This approach toward requirements usually results in several architecture-related issues that can potentially have negative impact on architectural practices, artifacts or design decisions [8].

2 REQUIREMENTS ISSUES IN AGILE METHODS

Little is known about how agile projects conduct requirements engineering [1]. Recent studies have identified several problems that could result from the lack of detailed requirements specifications [2]. The following paragraphs describe the requirements issues when using agile approaches.

- **Missing Requirements Engineering Activities:** clear specification of activities in the agile requirements engineering process is missing and there is a lack of a set of techniques that practitioners can choose from.
- **Missing Requirements Interface:** agile methods assume that it is very hard to elicit all requirements from the user upfront. They also assume that such requirements evolve over time as the customer may change its mind [6]. So, nobody knows the entire requirements at the beginning of the project. That leads to missing the interface between requirements. As a consequence, the impact on the next iterations may cause re-work as the requirements interfaces were not addressed.
- **Non-Functional Requirements Elicitation**: agile methods do not provide any widely accepted technique for eliciting and managing non-functional requirements [3]. After every iteration, the product is released and the customer is able to test the product. If he identifies problems related to non-functional qualities, the team can adapt the system to meet such requirements in the subsequent iteration without affecting too much the schedule. Often, the customer does not perceive as high impact many non-functional requirements (e.g., scalability, security, etc.). This may affect deeply the release of the final version of the application. This approach to non-

functional requirements may represent a major risk for agile methods since they lack specific techniques for their management.

2.1 Architecture Challenges in Agile Methods:

The agile requirements engineering approach toward requirements usually results in several architecture-related issues that can potentially have a negative impact on architectural practices, artifacts or design decisions [7]. Following paragraphs briefly, describe the most commonly observed architecture-related difficulties when using agile approaches.

Incomplete Requirements Elicitation: the "user stories" or the like are just the beginning points of both the requirements gathering and development processes in agile methods. Early requirements are simply a place to start. It is expected to add more requirements as more is known about the product. This attitude toward requirements makes software architecture development more difficult. The architecture that chosen by the team during the early cycles may become wrong, as laterof requirements become known [4].

- **Incorrect Prioritization of User Stories**: one of the key architecture-related challenges commonly experienced by agile teams is that User Stories may beprioritized without taking the technical considerations in to account [7]. If critical interdependencies among User Stories are discovered later on, it usually requires significant re-factoring with consequences for the whole structure of the software.
- **Lack of Focus on Non Functional Requirements**: as mentioned, handling of non-functional requirements in agile approaches is ill-defined [5]. Customers or users talking about what they want the system to do normally do not think about maintainability, portability, safety or performance. Some requirements concerning user interface or safety can be elicited during the development process and still be integrated. But most non-functional requirements should be known in development because they can affect thechoice of the database, programming language or operating system.

3 THE PROPOSED METHODOLOGY

The Requirement Engineering framework attempts to structure the agile RE process with minimal impact on agility. It reflects the agile principles such as direct stakeholder involvement,

evolutionary requirements, refactoring, no BRUF, just-in-time gathering of details and minimal documentation. Verification and validation activities in the existing agile methods are predominantly validation efforts carried out implicitly.

Preparation Phase – The objective of this phase is to establish rapport among the various project stakeholders. The development team learns the business process of the customers. Also, a high-level mission statement for the project is created which serves as the input to the next phase of the model.

Requirements elicitation and analysis - In this activity, the software engineers work with the customers and end-users to find out the application domain, services that system should provide, the required performance of the system, and so on. There are some identified problems that make the requirements elicitation difficult. To overcome these problems, the requirements gathering activity should be approached in an organized manner.

Requirement Prioritization Phase - Large software systems have a few hundred to thousands of requirements. Neither are all requirements equal nor do the implementation teams have resources to implement all the documented requirements. There are several constraints such as limited resources, budgetary constraints, time crunch, feasibility, etc., which brings in the need to prioritize requirements. Most customers on their part have a reasonable idea of what they need and what they want. But during requirements elicitation, the customer provides the Business Analyst (BA) with all the requirements that he feels will make his work easier. The customer is not wrong on his part; the BA needs to understand the needs of the business to prioritize the requirements.

Requirement Documentation Phase: Each identified requirement is decomposed into stories. The stories are brief descriptions of user- or customer- valued functionality. The stories are validated and the developers estimate the time required for their completion. The stories are implemented during the iterations. Hence, the developers estimate the time required to implement each story in this phase. The stories are then prioritized and stored in a prioritized story stack. A subset of the prioritized stories is chosen for development during an iteration which lasts for about 2 to 4 weeks.

Prototype Modeling & validation: This prototype is developed based on the currently known

requirements. Development of the prototype obviously undergoes design, coding, and testing, but each of these phases is not done very formally or thoroughly. By using this prototype, the client can get an actual feel of the system, because the interactions with the prototype can enable the client to better understand the requirements of the desired system. The focus of the previous steps is to provide a soft-structured approach to gathering requirements in the form of features, stories,and tasks. However, for completeness, we have included a component for implementation of these requirements which is the prototype modeling & validation phase. Also, the model has been designed for small-scale, non-mission and life-critical systems. This assumption requires viewing the model not only from a requirements engineering perspective but also from a development perspective. Hence, describing the development process is justified. The tasks created during the previous Phase are developed in this phase.

Review Meeting (feedback) & RE-prioritization: Acceptance tests ensure that the system developed meets the expectations of the customer. The customers create acceptance criteria for the stories and test the stories against the criteria. Developers create additional tests which augment those written by the customers. It is possible that code produced during a previous iteration be broken during subsequent iterations. Hence, acceptance tests from all the previous iterations should be run in order to ensure that all pieces of code show expected behavior.

4 PROPOSED METHODOLOGY – AGILE

4.1 Manifesto

This section discusses how the proposed methodology is reflective of the values and principles stated in the Agile Manifesto. The following paragraphs discuss the focal valuesand principles of the Agile Manifesto and how the proposed methodology reflects the agile philosophy.

- "**Individuals and Interactions over Processes and Tools**" and "**Customer Collaboration over Contract Negotiation**" are two of the focal values stated in the manifest to. The agile movement focuses on close team relationships, close working environments, and direct stakeholder involvement. Human aspects of the software development process are considered more important than the process itself. Relationships between the customers and the development team are given preference over strict contracts. Rather than

focusing on strict contracts, agile methods emphasize on collaborating with the customers to discuss the functionality expected of the system. These values are reflected in the proposed methodology in the following ways:

- ✓ The methodology emphasizes direct customer involvement. Customers and users are involved throughout the process.
- ✓ The activities described in the inception, features identification, features grouping, groups prioritization, and nonfunctional requirements identification are essentially meetings among stakeholders to discuss, elicit and validate the customer and user needs.
- ✓ Face-to-face communication among the members of the development team is encouraged especially during the features list identification.

- ➢ "**Working Software over Comprehensive Documentation**" is another value stated in the manifesto. The main objective of the software development team is to produce working software at regular intervals. Agile methods focus on iterative and incremental development. Working software is used to measure progress and minimal documentation is produced. The proposed methodology emphasizes on delivering working software to the customers at the end of each iteration. Documentation produced during the phases is minimal and mostly consists of product concept statement, feature list, groups and their prioritization, NFRs, high-level architecture, and task list.
- ➢ "**Responding to change over following a Plan**": The methodology accepts changes in the task list by adding, removing, or updating data requirements or changing business logic or business steps.

4 CONCLUSION

The conventional software development models try to define all essential requirements at the beginning of the software development phase by using huge effort.

Agile methods, on the other hand, do requirements engineering in iterations: the requirements are defined in detail only when they are implemented. Agile methods, however, have a lack of focus on certain parts of what is considered as important in requirements engineering. The customers don't usually cover nonfunctional requirements when they define requirements. Non-functional requirements are not precisely

handled in agile method and it would be good to concentrate more on these.

REFERENCES

1. J. Erickson, K. Lyytinen, and K. Siau, “Agile Modeling, Agile Software Development, and Extreme Programming: The State of Research” J. *Database Management*, 2005, vol. 16, no. 4, pp. 88–99.
2. J. Nawrocki et al., “Extreme Programming Modified: Embrace Requirements Engineering Practices,” *Proc. IEEEJoint Int’l Conf. Requirements Eng.* (RE 02), 2002, IEEE CS Press, pp. 303–310.
3. A. Eberlein, F. Maurer, F. Paetsch, "Requirements Engineering and Agile Software Development", Proceedings of the Twelfth International Workshop on Enabling Technologies: Infrastructure for Collaborative Enterprises, 2003.
4. J. Tomayko, “Engineering of Unstable Requirements Using Agile Methods”, *International Conference on Time-Constrained Requirements Engineering*, (2002), Essen, Germany, 9 September.
5. A. Eberlein, F. Maurer, F. Paetsch, "Requirements Engineering and Agile Software Development", Proceedings of the Twelfth International Workshop on Enabling Technologies: Infrastructure for Collaborative Enterprises, 2003.
6. K. Beck, "*Extreme Programming Explained: Embrace Change*", Addison- Wesley, 1999
7. M. Babar, "Going Agile? Beware of architecture-related changes and challenges", (2009b). Available at: http://www.acubecommunity.org/wikis/index.php/Architecturecentric_Methods_ and_Agile_Approaches.
8. S.Ambler, “Agile Requirements Modeling”, 2012 available at: http://www.agilemodeling.com/essays/agileRequirements.htm

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IMPLEMENTATION ON FUZZY DEEP NEURAL NETWORK FOR ATTACK DETECTION

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Abstract- In recent times, the massive quantity of data and its continual expansion have transformed the significance of information security and data analysis systems for Big Data. An intrusion detection system (IDS) is commonly employed to monitor and analyze data for the detection of intrusions in the network. The conventional IDS models are not adequate to handle the high volume, variety, and speed of big data. This paper presents a new quantum brain storm optimization (QBSO) based feature selection with fuzzy deep neural network (FDNN), called QBSO-FDNN model for IDS in big data environment. The proposed model enables to detection of intrusions in the big data environment. The presented model initially performs preprocessing to enhance the quality of the big data. Also, to reduce the computational complexity, QBSO algorithm is applied to elect an optimal set of features.

Keywords:- Intrusion Detection System, Big Data.

1. THE MAIN TEXT

The word Big Data defines enormous gathering of distinct data structures attained from several heterogeneous sources packed on memories where information is deliberate in Petabytes and zeta bytes. The 5 different dimensions are related by Big Data, classified as five Vs representing Variety, Volume, Veracity, Value, and Velocity [1].

All these dimensions have a vital part to act as Big Data Management Systems (BDMS) that is a modern term for handling Big Data Systems (BDS) [2]. Currently, information is investigated to resolve the secret pattern, unknown correlation, market trend, and several effective data to support industry and administrations in developing additional cognizant commercial decisions [3].

The BDS faces several problems in computation and investigating huge information to recover important data which can benefit in medicinal are, sports industries, business, etc. Implementing privacy in data is certainly a difficult process, in

previous times, the size of information gets increased. Similarly, the huge quantity of information is created from heterogeneous sources and enters distinct methods, like structured, unstructured, and semi-structured which result in the crash of commodity hardware.

In Cryptography, tokenization, reduplication of information is the certain manner which supports protecting private information from hackers. Though this method and novel cutting-edge tool have been designed to confirm the security of information, in the same way, attackers are arriving with novel methods to utilize the susceptibility existing in BDS involving its framework. Privacy in Big data strategy involves the safety of information created and security framework, availability of data, client authorization, and private message [4].

A major problem is solved by Intrusion Detection System (IDS). The massive increase in size of Big Data over differences in structured data needs enormous computation strength and time which generate very hard to acquire the perceptions of client's information in a moment. Furthermore, storing for data stream are distinguished via the large difference in data rate can over its capabilities.

However, advanced technology such as Hadoop Distributed File System (HDFS), Hadoop Map Reduce [5, 6], and modern processors such as i7, mainframe, Macintosh, and supercomputer, it has the probable of processing Big Data in moments. Several information methods are besides difficult in framework however, it is related with a heterogeneous source which generates the process and investigation of information becomes more complex.

Several scientists presented machine learning (ML) for IDS to decrease the false positive rate (FPR) and generate precisely. But, in order to handle Big Data, the ML conventional methods take time in learning and categorizing information [7]. Big Data methods and ML for IDS resolve several problems like speed and computation time and establish precise IDS. This model is to establish Spark Big Data methods which handle Big Data in IDS to decrease computational time and attain efficient classifier.

This paper presents a new quantum brain storm optimization (QBSO) based feature selection with a fuzzy deep neural network (FDNN), called QBSO-FDNN model for IDS in a big data environment. The proposed model enables to the detection of intrusions in the big data environment.

2. RELATED WORKS

Several studies have proposed for IDS. With the appearance of Big Data, the classical methods becoming very difficult to handle

Data. Thus, numerous studies proposed to utilize Big Data methods to generate maximum speed and precise IDS. Few scientists utilized ML Big Data methods for IDS to handle Big Data. [8]

Utilizes clustering ML method. Many scientists utilized k-means techniques in the ML library over Spark to define either the network traffic are attacked by hackers or not. In the presented technique, the KDD Cup 1999 was utilized for testing and training. In the projected technique the scientist never utilized the FS method to choose the relevant feature. [9]

Developed a clustering technique for IDS-dependent Mini Batch K-means integrated by principal component analysis (PCA). The PCA investigation was utilized to decrease the dimension of the processing dataset and next mini-batch K-means++ technique was utilized for clustered data. [10] Utilizes the classifier ML method.

The scientist presented an IDS method depending upon DT with Big Data in Fog platform. In these developed techniques, the scientist proposed a pre-processing technique for string in the provided dataset and next standardizes the data to guarantee the value of input data so as to enhance the performance of identification.

It is utilize the DT technique for IDS and linked these techniques with Naïve Bayesian (NB) and K-nearest neighbors (KNN) approach. [11] Presented the efficiency of NB, support vector machine (SVM), Decision tree (DT), and Random forest (RF) classifier technique of IDS by Apache Spark. The entire efficiency comparability is calculated over UNSW-NB15 dataset with respect to the accuracy, training, and predictive time.

Similarly, [12] presented real-world IDS dependent SVM and utilize Apache Storm architecture. This presented method is trained and estimated on KDD 99 datasets. Additionally, feature selection (FS) method is utilized in several studies. The PCA FS method designed in few presented IDS such as [13] introduced Big Data architecture for IDS in smart grid utilizing several techniques such as DT, SVM, NB, neural network (NN), and RF.

In these techniques, a correlation dependent technique is utilized for PCA and FS to reduce dimension. The presented methods are intended to minimalist the prediction time of the attackers and raise the accuracy of the classifier process. [14] Presented architecture for quick and precise identification of intrusion by Spark.

The projected architecture utilizes Linear Discriminate Analysis (LDA) and Canonical Correlation Analysis (CCA) models to reduce feature, and 7 classifier techniques. [15] Presented a

similar PCA integrated by equivalent SVM technique depending upon Spark platform (SPPCA- SVM). The PCA utilizes data investigation and extraction features to reduce dimension depending upon Bagging.

The presented technique utilizes KDD99 to train and calculate. [16] Presented optimize technique for FS. Scientists have developed Hadoop dependent equivalent Binary Bat Algorithm (BBA) for IDS. In these techniques, the scientist utilizes similar BBA for effective FS and optimization rate of detection.

The Map Reduce of Hadoop utilized to enhance computation complexities and equivalent NB gives a cost-efficient classifier. This projected technique is evaluated and trained over KDD99 datasets.

3. THE PROPOSED QBSO-FDNN MODEL

The working principle of the presented QBSO-FDNN model is illustrated in Fig. 1. The figure portrayed that the networking big data is initially preprocessed in different ways to enhance the data quality.

Followed by, QBSO algorithm is utilized to elect an optimal set of features from the preprocessed data. Consecutively, the FDNN model is employed to perform the classification process and allocate proper class labels of the big data.

3.1. Initialization Process

In the beginning, system's framework was authenticated, while the prolonged systems can support simultaneous processing of big datasets. Initially, Net Beans is introduced over JDK8.0, and mandatory library functions are used in Net Beans.

Next, Hadoop is employed which inclines to apply Yarn, Map Reduce, and HDFS. Subsequently, it undergoes initialization by Apache Spark which is in an identical cluster by Hadoop Map Reduce. They are designed for initiating simultaneous processing. At last, the beginning phase gets accomplished by NSL KDD Datasets imported to Net Beans.

Hadoop Map Reduce: Hadoop is called as "Big Data Handler" where the method is mostly utilized for monitoring the hugely created data. It is employed with Hadoop 2.6.0 for designing the method. This technique is used in several methods like HBase, HDFS, Pig, Map Reduce, Hive, and so on. In Hadoop, YARN controls the relevant assets and task scheduled functions. In particular circumstances, the information is needed and stored in HDFS.

Hadoop has the ability to store information in peta bytes and zeta bytes with no other restricted storage, and whereas it is employed with Map Reduce it provides quick computation. Map Reduce is determined as a batch centered program technique in

Hadoop which carries out managing of data and schedule tasks. It separates the information as to independent chunks which are calculated completely from map function tasks parallel.

Apache Spark: Spark's so-called BDS placed over Hadoop and designed for Hadoop Yarn. Now, it can be applied to Apache Spark version 2.1.0. It is independent of Map Reduce and HDFS. The units involved in Spark are Streaming, SQL, and MLlib (i.e., ML library). Various classifier methods in Apache Spark are yet employed.

Hadoop clusters executed on streaming data, Apache Spark, and interactive queries. Spark RDD: It assists a methodical technique which is similar to Map Reduce; however, it extends through "Resilient Distributed Datasets" (RDD) namely information sharing concept.

By the applications of abstraction, Spark is capable to acquire a broader processing cost which needs an exclusive engine, like ML, streaming, SQL, and graph theory.

3.2. Data Preprocessing

NSL KDD cup dataset is processed before it can be employed for IDS and upgraded via removal of repetitive measures in training data and with no other overlapping in testing data. Thus, it is computed to obtain a dataset with powerful computation, deficiency of repeated values, and non-existence of values in column.

It can be preprocessed over by employing Parse labeled point. In MLlib, the labeled point is applied in supervised learning methods. Similarly, it is applied twice to save a label, therefore, the labeled point can be used for classification and regression. Spark.ml package provides ML API established the data frame that develops the major part of Spark SQL library.

3.3. Quantum BSO based Feature Selection

The BSO model is extremely utilized for issues which could not be resolved by one individual. In order to control these issues, individuals from several backgrounds are collected for the brainstorm. An important purpose of brainstorming is to create several concepts (solutions) as feasible, and an optimal solution is achieved for solving the particular issue.

The BSO is a novel population-based ST technique simulated to the human brainstorming model. In BSO creates n arbitrary feasible results, and estimates to depends on the fitness function (FF). Based on BSO has of 3 steps that are clustering individuals, disrupting the cluster centers, and generating results.

The BSO clusters n separates as to m clusters utilizing

the *k*-means clustering method. In same results are clustered composed in all generations. The novel solution is created with probabilities of *P*, and it exchanges the cluster center (chosen arbitrarily), with the disrupting cluster center process [17]. At last, BSO creates the novel individual utilizing one cluster or by combined 2 clusters.

3.4 FDNN based Classification

FDNN model is employed for the simultaneous extraction of the fuzzy and neural representation data. The knowledge learned from the 2 aspects is integrated at the fusion layer to attain final representation for classifying data. The fuzzy based depiction minimizes the uncertainty and neural depiction discards the noise that exists in the input data.

The FDNN model makes use of two effective representations producing the fused depiction for end classification [19]. The FDNN model comprises *l* as layer number, indicates the input of the node and is the equivalent outcome. At the same time, the different parts involved in FDNN are discussed below. Demonstrates the structure of DNN model [20].

4. CONCLUSION

This paper has presented an optimal QBSO-FDNN model for IDS in big data environment. The proposed model enables to detection of intrusions in the big data environment. Firstly, the networking big data is initially preprocessed in different ways to enhance the data quality.

In addition, to decrease the computational complexity, QBSO technique is applied to elect a better set of features. The choice of optimal features by the QBSO algorithm helps to boost the detection performance. Consecutively, the FDNN model is employed to perform classification process and allocate proper class labels of the big data.

A widespread range of simulations was performed to point out the supremacy of the QBSO-FDNN model on benchmark dataset. The resultant experimental values showcased the superior performance of the QBSO-FNN model with the maximum detection accuracy of 98.90%.

REFERENCES

1. Zuech R, Khoshgoftaar TM, Wald R. Intrusion detection and big heterogeneous data: a survey. J. Big Data 2015;2(1):3.
2. Dietrich D, Heller B, Yang B. Data science & big data analytics: discovering. Analyzing, visualizing and presenting data; 2015.
3. Chen M, Mao S, Liu Y. Big data: A survey. Mobile Netw. Appl. 2014;19(2):171–209.
4. Moreno J, Serrano MA, Fernández-Medina E. Main issues in big data security. Future Internet 2016;8(3):44.
5. Wang L, Jones R. Big data analytics for network intrusion detection: a

survey. Int J Netw Commun 2017;7(1):24–31.
6. Download link (Hadoop): https://archive.apache.org/dist/hadoop/core/. Accessed on December 2017.
7. Donkal, G. and Verma, G.K., 2018. A multimodal fusion based framework to reinforce IDS for securing Big Data environment using Spark. Journal of information security and applications, 43, pp.1-11.
8. Ferhat K, Sevcan A. Big Data: controlling fraud by using machine learning libraries on Spark. Int J Appl Math Electron Comput. 2018;6(1):1–5.
9. Peng K, Leung VC, Huang Q. Clustering approach based on mini batch Kmeans for intrusion detection system over Big Data. IEEE Access. 2018.
10. Peng K. et al. Intrusion detection system based on decision tree over Big Data in fog environment. Wireless Com mun Mob Comput. 2018. https://doi.org/10.1155/2018/4680867.
11. Belouch M, El Hadaj S, Idhammad M. Performance evaluation of intrusion detection based on machine learning using Apache Spark. Procedia Comput Sci. 2018;127:1–6.
12. Manzoor MA, Morgan Y. Real-time support vector machine based network intrusion detection system using Apache Storm. In: IEEE 7th annual information technology, electronics and mobile communication conference (IEMCON), 2016. Piscataway: IEEE. 2016; p. 1–5.
13. Vimalkumar K, Radhika N. A big data framework for intrusion detection in smart grids using Apache Spark. In: International conference on advances in computing, communications and informatics (ICACCI), 2017. Piscataway: IEEE; 2017. p. 198–204.
14. Dahiya P, Srivastava DK. Network intrusion detection in big dataset using Spark. Procedia Comput Sci. 2018;132:253–62.
15. Wang H, Xiao Y, Long Y. Research of intrusion detection algorithm based on parallel SVM on Spark. In: 7th IEEE International conference on electronics information and emergency communication (ICEIEC), 2017. Piscataway: IEEE; 2017. p. 153–156.
16. Natesan P, et al. Hadoop based parallel binary bat algorithm for network intrusion detection. Int J Parallel Program. 2017;45(5):1194–213.
17. Pourpanah, F., Shi, Y., Lim, C.P., Hao, Q. and Tan, C.J., 2019. Feature selection based on brain storm optimization for data classification. Applied Soft Computing, 80, pp.761-775.
18. Yu Y., Yang L., Wang Y., Gao S. (2019) Brain Storm Algorithm Combined with Covariance Matrix Adaptation Evolution Strategy for Optimization. In: Cheng S., Shi Y. (eds) Brain Storm Optimization Algorithms. Adaptation, Learning, and Optimization, vol 23. Springer, Cham. https://doi.org/10.1007/978-3-030-15070-9_6.
19. Deng, Y., Ren, Z., Kong, Y., Bao, F. and Dai, Q., 2016. A hierarchical fused fuzzy deep neural network for data classification. IEEE Transactions on Fuzzy Systems, 25(4), pp.1006-1012.
20. Ramesh, S. and Vydeki, D., 2020. Recognition and classification of paddy leaf diseases using Optimized Deep Neural network with Jaya algorithm. Information processing in agriculture, 7(2), pp.249-260.

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A RECENT STUDY BASED ON MICROSERVICES IN ARCHITECTURAL STYLE

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Abstract - Micro services is an architectural style inspired by service-oriented computing that has recently started gaining popularity. In recent time many companies have adopted this technology for their domain in this paper we will discuss the history of software development and microservices architecture. And also some key points for future work in micro services.

1 INTRODUCTION

The mainstream languages for development of server-side applications, like Java, C/C++, and Python, pro-vide abstractions to break down the complexity of programs into modules. However, these languages are designed for the creation of *single executable artifacts*, also called *monoliths*, and their modularization abstractions rely on the sharing of resources of the same machine (memory, databases, files). Since the modules of a monolith depend on said shared resources, they are not independently executable. A monolith is a software application whose modules cannot be executed independently. This makes monoliths difficult to use in distributed systems without specific frameworks or ad hoc solutions such as, for example, Network Objects, RMI or CORBA.

However, even these approaches still suffer from the general issues that affect monoliths; below we list the most relevant ones:

Large-size monoliths are difficult to maintain and evolve due to their complexity. Tracking down bugs requires long perusals through their code base; monoliths also suffer from the “dependency hell”,in which adding or updating libraries results in inconsistent systems that do not compile/run or, worse, misbehave; any change in one module of a monolith requires rebooting the whole application. For large-sized projects, restarting usually entails considerable downtimes, hindering development, testing, and the maintenance of the project; deployment of monolithic applications is usually sub-optimal due to conflicting

requirements on the constituent models' resources: some can be memory-intensive, others computational- intensive and others require ad-hoc components (e.g., SQL-based rather than graph-based databases). When choosing a deployment environment, the developer must compromise with a one-size-fits-all configuration, which is either expensive or sub-optimal with respect to the individual modules;
Monoliths limit scalability. The usual strategy for handling increments of inbound requests is to create new instances of the same application and to split the load among said instances. However, it could be the case that the increased traffic stresses only a subset of the modules, making the allocation of the new resources for the other components inconvenient; monoliths also represent a technology lock-in for developers, which are bound to use the same language and frameworks of the original application.

2 HISTORY OF SOFTWARE DEVELOPMENT

Architecture is what allows systems to evolve and provide a certain level of service throughout their life-cycle. In software engineering, architecture is concerned with providing a bridge between system functionality and requirements for quality attributes that the system has to meet. Over the past several decades, software architecture has been thoroughly studied, and as a result software engineers have come up with different ways to compose systems that provide broad functionality and satisfy a wide range of requirements. In this section, we provide an overview of the work on software architectures from the early days to the advent of micro services.

2.1 Object-Oriented Design Patterns

The problems associated with large-scale software development were first experienced around the 1960s [12]. The 1970s saw a huge rise of interest from the research community for software design and its implications on the development process. At the time, the design was often considered as an activity not associated with the implementation itself and therefore requiring a special set of notations and tools. Around the 1980s, the full integration of design into the development processes contributed towards a partial merge of these two activities, thus making it harder to make neat distinctions. The advent and diffusion of object-orientation, starting from the 1980s and in particular in the 1990s, brought its own contribution to the field of Software Architecture. The classic by Gamma et al. covers the design of object-oriented software and how to translate it into code

presenting a collection of recurring solutions, called *patterns*. This idea is neither new nor exclusive to Software Engineering, but the book is the first compendium to popularize the idea on a large scale. In the pre-Gamma era patterns for OO solutions were already used: a typical example of an architectural design pattern in object-oriented programming is the Model-View-Controller (MVC) [33], which has been one of the seminal insights in the early development of graphical user interfaces.

2.2 Service-oriented Computing

Service-Oriented Computing (SOC) is an emerging paradigm for distributed computing and e-business processing that finds its origin in object-oriented and component computing. It has been introduced to harness the complexity of distributed systems and to integrate different software applications. In SOC, a program — called a *service* — offers functionalities to other components, accessible via message passing. Services decouple their interfaces (i.e. how other services access their functionalities) from their implementation.

2.3 The Second Generation of Services

The idea of componentization used in service-orientation can be partially traced back to the object-oriented programming (OOP) literature; however, there are particular differences that led to virtually separate research paths and communities. As a matter of fact, SOC at the origin was - and still is - built on top of OOP languages, largely due to their broad diffusion in the early 2000s. However, the evolution of objects into services and the relative comparisonshave to be treated carefully since the first focus on encapsulation and information is hidden in a *shared-memory* scenario, while the second is built on the idea of independent deployment and *message-passing*. It is, therefore, a paradigm shift, where both the paradigms share the common idea of componentization. The next step is adding the notion of *business capability* and therefore focusing analysis and design on it so that the overall system architecture is determined on this basis.

2.4 Software Development through Micro Services:

The micro services way of developing and managing software applications is more aligned with changing business needs, and that is the most important reason enterprises are gradually embracing it. In a challenging and dynamic business scenario, businesses need to quickly respond to changing needs, but monolithic software systems do not allow them to do so. Micro

services are more agile and responsive to changing situations. The main reasons for micro services' popularity include: Micro services applications allow fault isolation. Whenever there is an issue, the isolated, independent nature of the services allow separation from the main software and assessment. The software application remains unaffected while the fault is being fixed. Enterprises do not need to commit to a long-term to a particular technology stack because they can replace it with another one that fulfills their needs.

Since the services are isolated and independent, it is easy to gain knowledge and start working. Many prominent organizations have been leaving the monolithic system for microservice architecture, including Netflix, eBay, Amazon, the UK Government Digital Service, Twitter, PayPal, Sound cloud, The Guardian and many more. Netflix has been using microservices in SOA architecture with great success. It receives more than one billion calls every day through APIs from more than 800 diverse kinds of devices and then makes five additional calls to the backend service. eBay has moved to microservices as well with their core application comprising several smaller, autonomous applications. Each small application executes the business logic for different business areas of the application.

2.5 Future Development issues:

Microservices are so recent that we can consider their exploration to have just begun. In this section, we discuss interesting future directions that we envision will play key roles in the advancement of the paradigm.The greatest strength of microservices comes from pervasive distribution: even the internal components of the software are autonomous services, leading to loosely coupled systems and the other benefits previously discussed. However, from this same aspect (distribution) also comes its greatest weakness: programming distributed systems is inherently harder than monoliths. We now have to think about new issues. Some examples are: how can we manage changes to a service that may have side-effects on the other services that it communicates with? How can we prevent attacks that exploit network communications? There are many pitfalls that we need to keep in mind when programming with microservices. In particular, preventing programming errors is hard. Consequently, building dependable systems is challenging.

2.6 Interfaces:

Since microservices are autonomous, we are free to use the most appropriate technology for the development of each

microservice. A disadvantage introduced by this practice is that different technologies typically have different means of specifying contracts for the composition of services (e.g., interfaces in Java, or WSDL documents in Web Services [20]). Some technologies do not even come with a specification language and/or a compatibility checker of microservices (Node.js, based on JavaScript, is a prime example).

2.7 Behavioral Specification:

Behavioral types are types that can describe the behavior of services and can be used to check that two (or more) services have compatible actions. Session types are a prime example of behavioral types. Session types have been successfully applied to many contexts already, ranging from parallel to distributed computing. However, no behavioral type theory is widely adopted in practice yet. This is mainly because behavioral types restrict the kind of behaviors that programmers can write for services, limiting their applicability. An important example of a feature with space for improvement is non-determinism. In many interesting protocols, like those for distributed agreement, execution is non-deterministic and depending on what happens at runtime, the participants have to react differently. Behavioral interfaces are a hot topic right now and will likely play an important role in the future of microservices. We envision that they will also be useful for the development of automatic testing frameworks that check the communication behavior of services.

2.8 Trust and Security

The microservices paradigm poses a number of trust and security challenges. These issues are certainly not new, as they apply to SOA and in general to distributed computing, but they become even more challenging in the context of microservices. In this section, we aim to discuss some of these key security issues.

In monolithic architectures, application processes communicate via internal data structures or internal communication (for instance, socket or RMI). The attack surface is usually also constrained to a single OS. On the contrary, the micro services paradigm is characterized by applications that are broken down into services that interact with each other through APIs exposed to the network. APIs are independent of machine architectures and even programming languages. As a result, they are exposed to more potential attacks than traditional subroutines or functionalities of a large application, which only interacted with other parts of the same application. Moreover, application internals (the microservices) have now become

accessible from the external world. Rephrasing, this means that microservices can in principle send the attack surface of a given application through the roof.

3 NETWORK COMPLEXITY

The microservices vision, based on the creation of many small independent applications interacting with each other, can result in complex network activity. This network complexity can significantly increase the difficulty in enforcing the security of the overall microservices-based application. Indeed, when a real-world application is decomposed, it can easily create hundreds of microservices, as seen in the architecture overview of Hailo, an online cab reservation application.Such an intrinsic complexity determines an ever-increasing difficulty in debugging, monitoring, auditing, and forensic analysis of the entire application. Attackers could exploit this complexity to launch attacks against applications.

3.1 Heterogeneity

The microservices paradigm brings heterogeneity (of distributed systems) to its maximum expression. Indeed, a micro services-based system can be characterized a large number of autonomous entities that are not necessarily known in advance (again, trust issue); a large number of different administrative security domains, creating competition amongst providers of different services; a large number of interactions across different domains (through APIs); no common security infrastructure (different "Trusted Computing Base"); and last but not least, no global system to enforce rules.

4 CONCLUSIONS

We have presented a (necessarily incomplete) overview of software architecture, mostly providing the reader with references to the literature, and guiding him/her in our itinerary towards the advent of services and microservices. A specific arc has been given to the narrative, which necessarily emphasizes some connections and some literature, and it is possibly too severe with other sources. For example, research contributions in the domain of the actor model and software agent have not been emphasized enough, and still, modern distributed systems have been influenced by these communities too.

REFERENCES

1. Flow: A static type checker for JavaScript. https://flowtype.org/.
2. EvgeniiAkentev, Alexander Tchitchigin, Larisa Safina, and Manuel Mazzara. Verified type-checker for jolie. https://arxiv.org/pdf/1703.05186.pdf.
3. Edward B. Allen, Taghi M. Khoshgoftaar, and Yan Chen. Measuring coupling and cohesion of software modules: an information-

theory approach. In *Proceedings Seventh International Software Metrics Symposium*, pages 124–134, 2001.

4. Alexey Bandura, Nikita Kurilenko, Manuel Mazzara, Victor Rivera, Larisa Safina, and Alexander Tchitchigin. Jolie com-munity on the rise. In *9th IEEE International Conference on Service-Oriented Computing and Applications, SOCA*, 2016.
5. Len Bass. *Software architecture in practice*. Pearson Education India, 2007.
6. Len Bass, Paulo Merson, and Liam O'Brien. Quality attributes and service-oriented architectures. *Department of Defense,Technical Report September*, 2005.
7. James M. Bieman and Byung-Kyoo Kang. Cohesion and reuse in an object-oriented system. In *Proceedings of the 1995Symposium on Software Reusability*, SSR '95, pages 259–262, New York, NY, USA, 1995. ACM.
8. Andrew Birrell, Greg Nelson, Susan Owicki, and Edward Wobber. Network objects. *SIGOPS Oper. Syst. Rev.*, 27(5):217– 230, 1993.
9. Jan Bosch. Software architecture: The next step. In *Software architecture*, pages 194–199. Springer, 2004.
10. Mario Bravetti and GianluigiZavattaro. Towards a unifying theory for choreography conformance and contract compli-ance. In *Software Composition*, pages 34–50. Springer Berlin Heidelberg, 2007.
11. Lionel C. Briand, John W. Daly, and Jürgen K. Wüst. A unified framework for coupling measurement in object-oriented systems. *IEEE Trans. Softw. Eng.*, 25(1):91–121, January 1999.
12. Frederick P Brooks. *The mythical man-month*, volume 1995. Addison-Wesley Reading, MA, 1975.

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DIGITAL LOGIC BASED EDUCATION SYSTEM FOR STUDENTS' COMPETENCY

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Abstract- In line with the growing interest in extending the diversity of CS students, we examined the performance of a unique group of students studying an introductory course in Digital logic: ultraorthodox Jewish men, whose previous education was based mostly on studying Talmud and who lacked a conventional high-school education. We used questions from the Digital Logic Concept Inventory. We compared the results to those of religious Jewish men with a conventional high school education, and to the results reported in the literature. The ultraorthodox group performed better than the other groups in tasks that concerned number representation. No other statistically significant differences were found.

1. INTRODUCTION

There is a growing interest in extending the diversity of today's computer science (CS) students (Goode, 2008; McGill, Decker, & Settle, 2015; Sax et al., 2017; Varma, 2006) at all levels. Studying CS as a major domain can be a springboard for successfully entering the labor market and in turn, for increasing social mobility. Graduates can pursue a career in CS and in other relevant areas. Studying CS is also beneficial for students with other majors for the same reasons: computing now influences every aspect of our society, and it is a competitive advantage to know more about computing and its applications (Guzdial& Forte, 2005; Sax et al., 2017). In both cases, attracting students to enroll in CS courses is challenging. CS suffers from having an image of being an asocial profession, for geeks, as tedious and boring, and as a field that encourages individualism and competitiveness (Porter, Guzdial, McDowell, & Simon, 2013).

This image deters some students, especially those from the underrepresented minority groups, from enrolling in CS, either as a major or minor. A related challenge is to make CS approachable to those students from underrepresented groups who have enrolled in CS classes. There is a high dropout rate (Bennedsen &

Caspersen, 2007; Kinnunen & Malmi, 2006), especially from those groups in CS. Varma (2006) and others contend that CS courses should be made more minority-friendly and focus on the importance of building on students' capital and their prior, unique knowledge. Attempts at building on students' capital in the CS literature mostly focus on increasing students' sense of the relevance of CS to their lives, of making CS more understandable using examples relevant to students' lives, and thereby increasing their personal engagement and motivation.

These attempts include

a) Composing tasks relevant to youth culture, in particular, their interest in ICT and mobile technology (e.g. Goode, 2008; Guzdial & Forte, 2005);
b) Using day-today examples that appeal more to students from a specific background (Eglash, Bennett, O'donnell, Jennings, & Cintorino, 2006), and
c) Teaching a related field, more approachable to students, for example, the use of computational textiles to introduce technology and computer science to students in ways that broaden the appeal of STEM (Porter, Guzdial, McDowell, & Simon, 2013).

In the abovementioned studies, students' background included a certain acquaintance and familiarity with the formal schooling system. Therefore, in the pedagogical design, one could assume, for example, a certain body of knowledge in mathematics, certain learning competencies, and familiarity with school learning culture. In this work we deal with the issue of students from underrepresented groups, whose unique prior knowledge is based on an alternative education system and who lack formal education. Specifically, we investigated the performance of a unique group of students: ultraorthodox Jewish men, whose previous education was based mostly on studying Talmud and who lacked a conventional high school education, i.e. the scientific, humanistic, civil, and mathematics curricula.

Therefore, the studies on how to increase students' motivation or their sense of relevance of the topic studied in their day-to-day life are less relevant in this case. Instead, our work is motivated by the discourse about the attempts of such minorities to participate in STEM education, which often takes the form of emphasizing the deficits. Specifically, these ultraorthodox Jewish men's lack of formal knowledge is perceived in the academic and public discourse as

a source of difficulties, as a barrier to learning and development.

This perception perhaps relies on the importance ascribed to formal education in general, and STEM, in particular (manifested, for example, in the educational reform in the U.S.A. after the Sputnik crisis (Wissehr, Colcannon, & Barrow, 2011)). Less attention has been given to instances where this unique learning, experience, knowledge, cultural practices, values, and so forth may also enhance the productive participation of this population group in learning higher education subjects. In this study, we examined this issue.

2. LITERATURE REVIEW

2.1 The Interrelations Between Previous Knowledge and Learning

Learners' prior knowledge plays an important role in their learning processes. Specifically, the theory of constructivism views learning as a process of knowledge construction, which is knowledge dependent, that is, people use current knowledge to create and generate new knowledge (Resnick, 1989; Von Glaserfeld, 1995). New situations are interpreted with the existing knowledge, which in turn, initiates a process of refinement and extension of one's knowledge on the basis of productivity (Smith, Disessa, &Roschelle, 1994). Knowledge is not merely a set of facts and concepts. Resnick (1989) asserted that becoming competent in any complex subject domain is "as much a matter of acquiring the habits and dispositions of interpretation and sense making as of acquiring any particular set of skills, strategies, or knowledge" (p. 58).

Our experience and knowledge govern the sense-making of any situation, what we consider important and unimportant in the situation and the tools to think with (i.e. current knowledge) that we recruit to deal with it (Medin & Bang, 2014; Schoenfeld, 1992). It is thus expected that experts and novices would deal with and learn from a situation differently. Byrnes (1992) distinguishes between procedural knowledge and conceptual knowledge. Procedural knowledge knows the steps required to attain specific goals ("knowing how"), whereas conceptual knowledge consists of the core concepts for a given domain and their interrelation ("knowing that") (see also Rittle-Johnson & Schneider, 2014).

Star (2005) further explains that "the term conceptual knowledge has come to encompass not only what is known (knowledge of concepts) but also one way that concepts can be known (e.g. deeply and with rich connections)" (p. 408). Experts have accurate and rich conceptual knowledge with links to the procedural knowledge; this helps them to recognize subtle

nuances and quickly develop new understanding and skills when required. Novices' conceptual knowledge is of a lesser quality, however. They might tend to employ procedural knowledge, based on a "means-end" strategy (Bransford & Schwatrz, 1999).

2.2 Students' Performances In Digital Logic

Our work revolves around students' performances in the course Digital Systems, an introductory course on digital logic. Logic concepts are among the more difficult introductory CS topics for most students to learn. Herman, Loui, and Zilles (2009, 2010), Herman, Zilles, and Loui (2011), Herman, Kaczmarczyk, Loui, and Zilles (2012) studied students' conceptual (mis) understandings and their problem-solving strategies. Utilizing talk-aloud protocols, students were asked to verbalize their thought processes while solving problems. The authors identified chaotic conceptual knowledge underlying students' difficulties in problem solving in the main topics of digital logic (State and sequential circuits, Number representation, MSI components, and Boolean logic).

A prominent finding was students' tendency to remain at the procedural level, namely to recall a procedure that proved to be useful in problems they had identified as resembling the one at hand (Herman, 2011; Herman, Kaczmarczyk, Loui, & Zilles, 2008; Herman et al., 2011). In fact, the literature is replete with empirical evidence on the differences between the ways and the qualities that novices and experts in different domains deal with problems, a difference rooted in the quality of the conceptual knowledge and how well it is connected to one's procedural knowledge.

3. ULTRAORTHODOX JEWS

3.1 The Ultraorthodox Jews in Israel

In 2014, the ultraorthodox Jews comprised 11% of the Israeli population. This group is divided into many subgroups that differ from one another in their specific ideologies and lifestyles. The uniqueness of the ultraorthodox Jewish community (Haredi) lies especially in its radical and stringent religious demands, mainly manifested in their extremeness in studying the Torah, the central reference in Judaism. The majority of Haredi men do not participate in the Israeli labor force. Instead, many dedicate most of their time to studying in a yeshiva (Talmudic academia, discussed later). Specifically, in 2014, only 44.5% of Haredi men were employed (in comparison with 81% of the general population of men in Israel, ages 25–64).

According to the 2013 report of the Central Bureau of Statistics,

68% of Haredi women work. However, they tend to work in the field of education, which is characterized by part-time jobs and low wages. As a result, most ultraorthodox households are below the poverty line. The proportion of the population below the poverty line in Haredi society (52%) is much higher than that of the general population (19%) and it has been stable since 2006. The percentage of ultraorthodox children in poverty is very high (67%) and these families' per capita income is 47% lower than that of the general population. In recent years, the government of Israel has invested substantial efforts in integrating Haredi people, both men and women, into the labor force, in ways that would allow them to maintain their unique life style.

Computing education has the potential to offer higher wage jobs. In addition, the field of computing does not conflict with their faith and unique ideology; one can work from home and use a "kosher internet program", namely have access to the internet but one that is restricted according to different Haredi requirements (Campbell & Golan, 2011). Indeed, there is interest in CS studies among this population group. In a survey conducted in 2008 by the Ministry of Economy, 49% of the ultraorthodox men were interested in academic education, and of these, 23% were interested in computing education of some sort (Malachi, Cohen, & Kaufman, 2008).

3.2 Unique Prior Education: Talmudic Studies

Haredi men lack conventional, formal education, including science, mathematics, technology, and English. In fact, in 2013 only 2% of Haredi boys earned matriculation certificates (in contrast to 17% of Haredi girls) (Malach, Choshen, &Cahaner, 2016). Instead, their prior education is based on Talmudic studies (sometimes for 10 h a day). The Talmud is a body of arguments and discussions about all aspects of human life: social, legal, and religious. This canonic text was completed over 1500 years ago and its argumentation and debates contain many logical principles and examples (Abraham, Gabbay, & Schild, 2009, 2011a, 2011b; Abraham, Gabbay, Schild, Hazut, & Maruvka, 2011). In fact, Talmudic texts commonly take the form of a written transcript of an ever lively, usually agonistic, and occasionally vituperative oral discussion. Women do not study the Talmud.

They undergo formal education, though often at a lower level than do other sectors. The most common contemporary framework for the Talmudic study process within the study halls is the Havruta– (lit. company, friendship, from Haver: friend) –

paired study. The students of the yeshiva have pages of the Talmud before them and they collaboratively engage in debating the meaning of any given section while intellectually juggling a host of other interpretations given for the same section, whether recorded on a given page or not (Blum-Kulka, Blondheim, & Hacohen, 2002). Talmud studies are not goal oriented. In Talmud studies, as well as other religious studies, "the religious obligation to study the (Talmudic) law is not goal-oriented, but concerns itself merely with process" (Blum-Kulka et al., 2002, p. 1576).

This is inherently different from formal education, which is implemented in the form of goals and objectives (e.g. passing tests, getting a diploma), thereby emphasizing achievements. "The ideal of Torah lishma (Torah study as an end unto itself) underscores the perception that time spent on disagreement is of the same religious value as that expended on reaching an agreement" (Ibid). This philosophy is significant for the life style of the ultraorthodox men.

3.3 The Unique Prior Education: A Barrier or Leverage for Learning?

This unique prior education is often perceived as a barrier to find well-paying jobs and providing for their families. For example, Malach, Choshen, and Cahaner (2016) describe three barriers: (a) a knowledge barrier, "a lack of general studies, matriculation certificates, and professional qualifications" (p. 8); (b) cultural barriers, such as the "reluctance to work in a mixed-gender and mixed religious-secular environment" (ibid); (c) "barriers to better-paid employment" (ibid), for example, the preference for part-time employment among ultraorthodox workers. Similar terminology is used by Cohen (2005), who asserts that the extensive religious studies of ultraorthodox men are almost worthless and they need to start from scratch in order to find a job.

However, a few empirical works that investigated the performance of Haredi students in mathematics portray a more complicated relationship between the background of the Haredim and their performance. Dembo et al. (1997) compared the performances of post-primary students and Haredi students as they coped with the topic of area and perimeter in geometry. As expected, the lack of formal knowledge was prominent in the reasoning of Haredi students, whose background was manifested, for example, by the absence of formulas. However, these students had an advantage over the other group in their ability to solve problems, because they employed logical judgment and other considerations.

Dembo et al. (1997) ascribed these performances to the unique Talmudic experience, which as discussed previously, is replete with judgment and consideration, which in turn, are embedded in the use of logical operations. Ehrenfeld (2016) examined the discourse of Haredi students in a preparatory program in mathematics. He found that in the mathematics class these students employ certain cultural practices stemming from the yeshiva, especially aspects concerned with exploration and argumentation, as well as the legitimacy for disagreement and commitment to understand the text. This underlies their tendency to employ an explorative discourse in his class rather than a ritual one and to employ and pursue a conceptual understanding rather than a procedural one.

3.4 Research Questions and Rationale

In this study, we focused on a group of ultraorthodox Jewish men who had studied the course on Digital Systems, an introductory course to digital logic. As explained before, these students had undergone a unique prior education. They lacked a conventional, formal education, but had an alternative, rich Talmudic education. Is the unique Haredi background merely a hindrance to students' competency in digital logic? Could this unique background leverage their learning? On the one hand, employing a "deficit" approach, these students lack a body of knowledge, included in formal school education (Science, English, and so forth) and, therefore, they might perform some sorts of tasks worse than regular students would. On the other hand, employing a generative approach, these students, might employ certain cultural tendencies from the yeshiva, such as aspects of exploration and argumentation to cope with the domain (Ehrenfeld, 2016). In addition, their Talmudic learning is based on logical arguments and discussions about various aspects of life; hence, they might possess a general conceptual framework of logic that they could apply to a new context.

4. METHODOLOGY

We employed a mixed-methods methodological approach, and more specifically, a quantitatively driven mixed-methods approach. In such an approach, the research study is, at its core, a quantitative study. The qualitative method is added to supplement and improve the quantitative study by providing an added value or more complex answers to research questions (Creswell, 2013). Our main research tool is a test, which we used to analyses the performance of students with a Talmudic background compared with the performance of their counterparts

who have a conventional K-12 background. A supplementary, talk aloud protocol with four students with Talmudic backgrounds enabled us to shed light on students' knowledge and strategies when solving problems, thereby providing a richer answer to our research question.

6. CONCLUSIONS AND PRACTICAL IMPLICATIONS

We concluded that the students' unique prior knowledge was not only a source of students' weaknesses – it was also a source of their strength. This conclusion has an important implication, given the growing interest in diversifying CS to include representatives of groups in society that come from different, unique cultures. Students' unique previous knowledge can and should be mapped, not only to foresee misconceptions, namely faulty extensions of previous knowledge, and weaknesses that are an outcome of "fragile knowledge" or the absence of a certain body of knowledge (in our case, knowledge of English) (Smith, Disessa, & Roschelle, 1994), but also in terms of possible strengths, knowledge, and practices that canbe used to support the new knowledge.

There is already empirical work in the CS literature reporting successful attempts to build on students' capital (e.g. Eglash et al., 2006; Guzdial & Tew, 2006). However,we do not aim at increasing students' motivation or their sense of relevance of the topic studied in their day-to-day life, but rather, the approach we suggest is concerned with mapping or assessing students' existing knowledge while looking for strengths, i.e. the possible productive and non-productive extensions of existing knowledge and practices in order to cope with and assimilate the new knowledge studied. Such a pedagogical approach might be beneficial in terms of reducing the dropout rates because it might facilitate the teaching/learning process by allocating more or less time according to the knowledge mapped, thus providing access to fragile or absent pieces of knowledge, and tackling unforeseen misconceptions.

Concept inventories, such as the DLCI, can be useful as a first step in assessing the knowledge of a unique group of students. However, the students' tendency to employ a different approach, based on conceptual understanding, was not revealed in the descriptive statistics, usually applied when using these tools. Rather, a second stage of research, an explorative stage, was necessary. In our case, the talk-aloud protocols enabled us to shed light on students' practices and the conceptual understanding underlying their choice of either correct or incorrect answers. We therefore recommend

that mapping the knowledge of a unique population be carried out using a two-step analysis: first detecting a certain behavior and then exploring it. The exploration phase should be aimed at recognizing strengths and determining how previous knowledge anchors and supports them.

REFERENCES

1. Abraham, M., Gabbay, D., & Schild, U. (2009). Analysis of the Talmudic argumentum a fortiori inference rule (Kal-Vachomer) using matrix abduction. Studia Logica, 92, 281–364.
2. Abraham, M., Gabbay, D., & Schild, U. (2011a). Obligations and prohibitions in Talmudic deonticlogic. Artificial Intelligence and Law, 19(2), 117–148.
3. Abraham, M., Gabbay, D., & Schild, U. (2011b). The handling of loops in Talmudic logic, with application to odd and even loops in argumentation. In David Reheard, Andrei Voronkov, and Margarita Korovina (Eds.), Proceedings of higher-order workshop on automated runtime verification and debugging (Howard 60) (pp. 140–164).
4. Abraham, M., Gabbay, D., Schild, U., Hazut, G., & Maruvka, Y. (2011). Logical analysis of the Talmudic rules of general and specific (Klalim-u-Pratim). The Journal History and Philosophy of Logic, 32, 47–62.
5. Bennedsen, J., & Caspersen, M. E. (2007). Failure rates in introductory programming. ACM SIGCSE Bulletin, 39(2), 32–36.
6. Blum-Kulka, S., Blondheim, M., & Hacohen, G. (2002). Traditions of dispute: from negotiations of Talmudic texts to the arena of political discourse in the media. Journal of Pragmatics, 34(10), 1569–1594.
7. Bransford, J. D., & Schwatrz, D. L. (1999). Rethinking transfer: a simple proposal with multiple implications. Review of Research in Education, 24, 61–100.
8. Byrnes, J. P. (1992). The conceptual basis of procedural learning. Cognitive Development, 7(2), 235–257.
9. Campbell, H., & Golan, O. (2011). Creating digital enclaves: negotiation of the internet among bounded religious communities. Media, Culture & Society, 33(5), 709–724.
10. Cohen, B. (2005). Economic hardship and gainful employment in Haredi society in Israel an insider's perspective. Jerusalem: The Floersheimer Institute for Policy Studies. Retrieved June 26, 2017,from http://fips.huji.ac.il/sites/default/files/floersheimer/files/cohen_economic_hardship_in_haredi_society.pdf
11. Creswell, J. W. (2013). Research design: Qualitative, quantitative, and mixed methods approach. Thousand Oaks, CA: Sage Publications.

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AN ANALYTICAL APPROACHES FORM DYSLEXIC MOBILE APPLICATION FOR SIGHT WORD READING SYSTEM

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Abstract- Dyslexia is an indicating term for learning disorder due to the difficulty in identifying speech and sound of letters and words, causing reading difficulty. Most children with dyslexia utilise the greater part of their senses to connect with their environment. One of the difficulties faced by dyslexic children is their troubles expressing their emotion or thought through verbal or written communication due to limited vocabulary, which is caused by issues in perceiving letters, sound and importance of the word overall. Sight word reading is a methodology with various reading stages and fascinating diversion with the purpose to create a fun reading experience.
Keywords: Dyslexia, Reading Skills, Sight Words, Mobile Application.

1. INTRODUCTION

Dyslexia is a specific learning disability characterised by the inability to decode and recognise words which have been shown to originate from neurobiological (Lyon et al., 2003). Children with dyslexia utilize the greater part of their faculties to speak with their environment. They are effectively pulled in to images instead of words and are exceptionally inventive. Many individuals relate the words “learning inability” and “dyslexia” to the words “idiotic” or “unintelligent”. This is in actuality the most remote clarification from reality.

Dyslexia is really a trouble with language, not knowledge (Bouquett and Lindsey, 2008). Dyslexia is a weakness in the capacity to read (Farrell and Osenga, 2013). Instead, dyslexic individuals have difficulties with reading and spelling regardless of having the ability to learn. To overcome this difficulty, an appropriate learning approach should be carried out in order to fulfil this special learning needs. There are different ways to help dyslexic children build up their reading achievement for instances, repeated reading, sight word drills and syllable example (Fawcus, 2000; Griffin and Appel, 2016). Sight words give a fantastic establishment to reading (McArthur et al., 2013) as the higher the frequency the word

appears to the child, the more likely he/she is ready to perceive and comprehend the importance of the word overall (Garg, 2016).

Currently, reading with dyslexic children requires assistance from adults and in most cases, is a one-to-one approach as an adult need to present flash cards to the child while reading. This can be time consuming and most of the children cannot practise reading independently. Furthermore, these special children have a very short span of attention which make reading even more challenging. Computer aided reading tool, for instance, a mobile application seems like a reasonable solution as it can be designed to be engaging and relatively easy for the children to handle on their own.

However, dyslexic children have difficulty reading from white or glaring background (Meares, 1980) such as white paper or computer screen. This leads to a dire need for a mobile application that can assist dyslexic children in reading independently as current mobile applications for reading is designed for normal children.

The aim of this mobile application is to assist primary school children with dyslexia, aged 7 to 12 to increase their vocabulary size. The novelty in our mobile application is the integration of sight words approach. This is similar to how manual flash cards are presented when the children are reading but without the assistance from an adult. This promotes independent reading as the children have the freedom to listen to the words whenever they required. As our focus is on vocabulary size, in order to evaluate the effectiveness of our mobile application, the children are required to take quizzes in the form of game, before and after reading the stories with sighted words to observe how many of the words they can recall.

1.1 Background

This project, a mobile game-based learning application has been created for children with dyslexia to enhance their instructive learning. By utilizing smartphones, they can access the lessons effectively and rehearse at anyplace convenient. Multimedia elements are integrated into the mobile application to make the learning environment more attractive and interactive for this special group of children. The learning progression of dyslexic children is slower compared to normal children, causing them to barely comprehend and struggling to catch up in class. For the time being, the number of applications that is specially developed for dyslexic children is limited. Alghabban et al. (2017) proposed a customized mobile learning application using cloud computing technology to meet the needs of the children with dyslexia. The study

shows that their learning capabilities has enhanced by using the mobileapplication. Samsudin (2017) has proposed a mobile application to measure dyslexia learning skills with multisensory approach and showed a satisfactory result.

The study proven that interactive design such as rhythmic, voice output, songs, videos and animations plays an important role in the learning process for children with dyslexia. Apart from that, a research work proposed by Azmi et al. (2017) has developed a mobile application for children with dyslexia that emphasises on learning the alphabet in Malay language. The results show that interactive and multimodal mobile application encourages dyslexic children to become more focus during the learning session and their help them to improve. The existing mobile applications that enforce reading skill for dyslexic children are mostly based on phonics awareness approach and sight words remain only to be used as manual flash cards to teach basic reading. Although story-based applications are currently available in the mobile application stores for normal children, some of the features are not suitable for children with dyslexia. For example, the font type and background colour used are not suitable for children with dyslexia. Furthermore, the Dyslexia Association of Sarawak Centre does not adopt Information and Communication Technology (ICT) in their teaching and learning processes. Rather, traditional flashcard method is used to introduce the new words to the children at that centre, triggering the initiative to develop an interactive mobile application.

2. METHODOLOGY

An earlier version of the mobile application, Mr. Read V1.0 by Borhan et al. (2015), was developed and tested with the primary school students with dyslexia. The outcome shows that there are several enhancements required in order to consistently encourage and attract the dyslexic children using the mobile application to practise reading on their own. This leads to the enhancement in Mr. Read V2.0.

Like the previous version, the sight words used in Mr. Read V2.0 are based on Dolch's Sight List (Johnson, 1971). The Dyslexia Association of Sarawak Centre also have been using Dolch's list for teaching sight words. This made dyslexic primary school students become more familiar with the content of both versions of Mr. Read mobile applications. The sight words are incorporated in short stories, rhymes and song verses in this mobile application. Besides that, a sight words quiz game has also been developed to test the children's understanding

by providing the game scores that reflects their reading ability. Reading ability in this context means the ability to sound out, recognize and recall words. Mr. Read V2.0 has been developed based on the suggestions and comments from the instructors working for the dyslexia centre. Mr. Read V2.0 has additional elements too, which have been re-tested in another separate session with the dyslexia primary school students at the Dyslexia Association of Sarawak centre. Table 1 shows the comparison between Mr. Read V1.0 and an enhanced version Mr. Read V2.0, which is the main contribution of this research study.

2.1 Proposed Solution

The following are the screenshots of Mr. Read V2.0 mobile application which have been implemented. Figure 1 demonstrates the main menu of Mr. Read V2.0. There are three fundamental parts, namely particular instruction, background sound and modules. If further assistance is required, the user may click "Help" at any time and the guideline will be provided. The user can tap on the sound button to empower the background sound. There are four modules for user to pick, to be specific as "Story", "Rhyme", "Song" and "Game". Figure 2 demonstrates the menu for Story Module. There are three different submodules/stories accessible through buttons for "Story 1", "Story 2" and "Story 3". For instance, the user may tap on the button "Story 3" and will be directed to the main page of Story 3 which appeared in Figure 3. If the user taps on the "Guideline" button (button with speaker image), he or she can listen to the title and story instruction. To begin reading the story, the user may tap the "Read Story" button. In this page, three sight words are highlighted as shown in the figure. The user can tap on any of the three sight words to learn how to spell and sound out the respective sight word. For an example, user tap "Once" and will lead the user to the popup box as shown in the user can tap on the button with speaker image to listen back to the sight word and the spelling. The user can tap on the "X" button to continue perusing the story.

Fig. 1 Main menu of Mr. Read V2.0

Fig. 2 Menu for story module

Fig. 3 Main page of story 3

3. RESULTS AND FINDINGS

This section presents the results and findings of the testing sessions of Mr. Read V2.0. The results are presented in two sections: The performance of the eight dyslexic primary school students before and after using the mobile application and the outcome from the usability testing with the dyslexic primary school students, four teachers and two parents.

The students' improvement is measured by the average game scores achieved from three sets of quizzes they had taken, which consist of the game scores before reading from any of the modules, game scores after reading Story 1 and game scores after reading Story 2 and 3 in Mr. Read V2.0. Based on the result above, the average scores gradually increase from 69.13 to 97.88%. A notable effect after all three quizzes, five of the eight students showed improvement from having difficulty to spell and sound out words to

confidently spelling out the words. Some of the words the that the students have difficulty to pronounce are 'hungry', 'changes', 'learn', 'first', 'egg', 'when' and 'after'. This shows that, with the Story module, the students learn and recognize words more effectively. Other than sight words, one of the features contributed to the students' improvement is the replay button which encourages students to repeatedly learn the words that they felt difficult to pronounce.

From the usability testing with the students, parents and teachers, in view of Figure out of respondents strongly agreed that the mobile application is easy to use and manage. Not only that, out of respondents strongly agreed that all the instructions are exhibited in simple and straightforward language. They can explore the applications effortlessly without much clarification.

This demonstrated that the Mr. Read V2.0 is simple and usable. Apart from that, the finding demonstrated that the Mr. Read V2.0 is clear and easy to use for the majority of the respondents.

In view of the outcome, 85.71% of the respondents are happy with the user interface design, colour and picture utilized. However, in the Story module, one of the respondents disagreed with the user interface because the respondent felt that the colour foundation has smothered the writings, which will make it harder for the children with dyslexia to read. Furthermore, concerning the use of sound, 12 out of 14 respondents have strongly agreed that the sounds used are alluring and the sound used for instruction and narration are suitable and clear. With respect to the viability in learning of sight words which can be referred in Figure 4 indicated all of the respondents with 11 of them are strongly agreed hat Mr. Read V2.0 learning approach is effective.

When the response on the efficiency of learning are compared to the test results of the dyslexic primary school students, the students have shown an increase in game score after reading the first story then followed by the second and third stories. The increased of game scores have shown that Mr. Read V2.0 is effective in helping dyslexic children to improve their reading ability.

Likewise, one of the respondents suggested that the dyslexic children should be given the capacity to record themselves sounding out the sight words rather than just showing the sight words. Another suggestion is to add more variety of stories into the story module.

This demonstrates that Mr. Read V2.0 can be further enriched and marketed. Moreover, 6 out of 14 respondents, who are educators

and parents, expressed that the general idea of this mobile application is extraordinary since they typically utilize flash cards to show sight words.

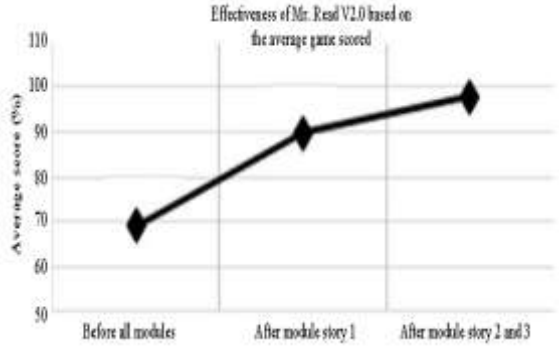

Fig. 4 Results of game scored to evaluate the effectiveness of Mr. Read V2.0

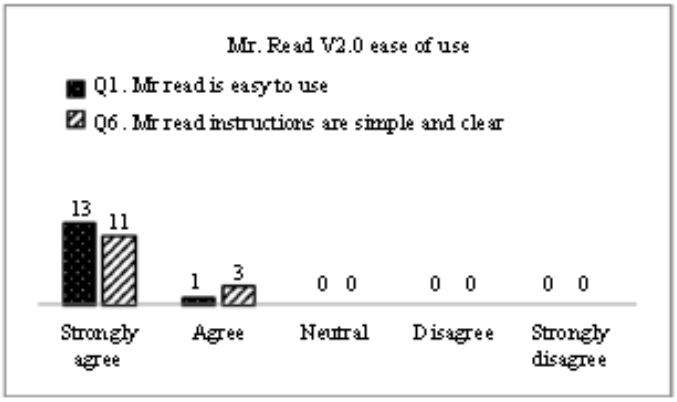

Fig. 5 Mr. Read V2.0 eases of use rating results

4. DISCUSSION

This study was conducted to see if sight word instruction integrated into the mobile application has any impact on the overall reading ability of dyslexic primary school students. The main research question for this study is how effective using sight words approach in a mobile application to improve the reading ability of dyslexic students? Throughout this study, two major findings are found which are the sight word instructions through mobile application, has improved the overall reading ability of the children with dyslexia and this has subsequently improved their confidence in reading. These findings indicate that generally, using mobile application as a learning platform to teach sight words is effective in helping dyslexic children to improve their reading skills. Therefore, the enhanced mobile application, Mr. Read V2.0 has the potential as an additional learning tool for the children with dyslexia.

5. CONCLUSION

Throughout the evaluation session, dyslexia primary school students

continuously played the game and sang along the song. This demonstrates their interest in the mobile application. This could be partially contributed to the recognizable music and word game that motivate them to continue playing and learning through the application. The high number of positive responses also demonstrates that the upgraded mobile application, Mr. Read V2.0 is effective in developing reading and spelling abilities among dyslexic children.

Theutilization of sight words in various learning stages can improve their reading ability. The usability and attractive user interface of the Mr. Read V2.0 as far as design, selection of colours, sounds and pictures make children with dyslexia able to explore the mobile application effortlessly. Thus, the objectives of the enhancement of Mr. Read V2.0 have been satisfied and accomplished.

Future works will involve adding more interactive learning features such as an audio record of users' voice so that dyslexic children to replay back and learn to pronounce the sight words at their own pace. Besides, the improvement on mobile application contents will be considered for future work. We strongly encourage adoption of this method as an alternative way to improve reading skill among children with dyslexia.

REFERENCES

1. Alghabban, W.G., R.M. Salama and A.H. Altalhi, 2017.
2. Mobile cloud computing: An effective multimodal interface tool for students with dyslexia. Comput. Human Behav., 75: 160-166.
3. Azmi, A.Z., N.H. Nasrudin, A.W.N. Wan and J.R. Ahmad, 2017. Mobile application to writing skills ability among dyslexic children: CiNTA. J. Fundamental Applied Sci., 9: 195-209.
4. Borhan, N.H., H. Sharbini, J.A. Ahmadi and P.C. Chiu, 2015. Developing reading skills using sight word reading strategy through interactive mobile gamebased learning for dyslexic children. Int. J. Innovat. Educ. Res.
5. Bouquett, K.E. and S. Lindsey, 2008. Systematic sight word instruction for reading success: A 35-week program. Scholastic Inc.
6. Farrell, L. and T. Osenga, 2013. Comparing the dolch and fry high frequency word lists. Readsters, LLC.
7. Fawcus, M., 2000. Children with Learning Difficulties: A Collaborative Approach to their Education and Management. 1st Edn., Wiley, London, ISBN-10: 1861560184, pp: 334.
8. Garg, S., 2016. Game based learning in education: The 21st century pedagogy.
9. Griffin, S.M. and K.L. Appel, 2016. Reading strategies.
10. Johnson, D., 1971. The dolch list re-examined. Read. Teacher, 24: 449-457.
11. Lee, S.H., 1999. Usability testing for developing effective interactive multimedia software: Concepts, dimensions and procedures. Educ. Technol. Society, 2: 1-13.
12. Lyon, G.R., S.E. Shaywitz and B.A. Shaywitz, 2003. A definition of dyslexia. Ann. Dyslexia, 53: 1-14.

13. McArthur, G., A. Castles, S. Kohnen, L. Larsen and K. Jones et al., 2013. Sight word and phonics training in children with dyslexia. J. Learn. Disabilities.
14. Meares, O., 1980. Figure/ground, brightness contrast and reading disabilities. Visible Lang., 14: 13-29.
15. Samsudin, R., 2017. Dyslexia aide (Mobile Learning Application for Dyslexic Kids). Int. J. Software Eng. Technol.
16. Shiratuddin, N. and S.B. Zaibon, 2011. Designing us experience for mobile game-based learning.
17. Proceedings of the International Conference on User Science and Engineering, Nov. 29-Dec. -1, IEEE Xplore Press, Shah Alam. DOI: 10.1109/iUSEr.2011.6150543

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ALGORITHM BASED PEDESTRIAN DETECTION FOR CONTEXT INFORMATION

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Abstract- Detecting pedestrians among other objects in a digital image is a relevant task in the field of computer vision. This paper presents a method to improve the performance of a pedestrian detection algorithm using context information. A neural network is used to classify the region below pedestrian candidates as being floor or non-floor. We assume that a pedestrian must be standing on a floor area. This scene context information is used to eliminate some of the false-positive pedestrian candidates, therefore improving detector precision. The neural network uses 10 feature channels extracted from the original image to perform the region classification. This method may be used along with a large family of pedestrian-detecting algorithms.
Keywords: Feature Extraction, Pedestrian Detection.

1. INTRODUCTION

The pedestrian detection problem has attracted much attention in the field of computer vision due to its application in vision-aided Navigation Systems (INS) for automobiles (Panahandeh et al., 2012; Conrad and DeSouza, 2010), surveillance and elder people assistance. It is a challenging problem considering that some applications encompass great variations of illumination, pose and scale (Pears and Liang, 2001).

For the last 15 years, pedestrian-detecting algorithms have made great strides. Some of these strides are due to the challenges posed by image databases used for training and testing (Dollár et al., 2009). The challenges imposed by the databases are catalysts for progress in some fields of computational vision.

Zhang et al. (2016) analyzes the main methods for pedestrian detection considered state of the art. The authors conclude that in spite of recent improvements, there is still room for progress and the use of information context is one of the most promising ways for achieving better results.

Context information is the data gathered from the image that

do not directly belong to the searched object. Following Abowd et al. (1999), context information can be defined as "any information that can be used to characterize the situation of an entity, where an entity can be a person, place, or physical or computational object". The presence of a scene element can corroborate the algorithm response and help to gain confidence. This is the case of floor presence information applied to the pedestrian detection problem. With the exception of cases in which occlusion occurs, intuitively we can say that for each pedestrian on the scene there is a floor area just below.

In the work presented in Candido and Marengoni (2017), a neural network was used to classify an image area into floor or non-floor classes in order to perform a segmentation of the ground plane in outdoor images. Here the same idea was used to enhance pedestrian detector performance in an integrated system. The neural network analyzes the area below each pedestrian candidate selected by the detector algorithm and the response is combined with the candidate score and some of the false-positive candidates are eliminated in this process.

Extensive tests were applied along with the Caltech pedestrian database (Dollár et al., 2009). The Caltech- USA database is known as a benchmark in pedestrian detection algorithms and is widely used for training and testing. It consists of approximately 10 h of 30 fps video filmed from inside an automobile driving through urban regular traffic. Results show that the use of floor presence information can improve the accuracy of a pedestrian detection algorithm by up to 7%.

Fig. 1: Examples of pedestrians in outdoor scenes. Differences in pose, lighting.

The classifier was trained with a large number of example patches selected from images from the Caltech- USA database (Dollár et al., 2009). Positive examples were cropped from regions where

pedestrians can walk: asphalt, sidewalk and grass. Negative examples are patches of buildings, cars, trees etc. The ANN was trained, tested and evaluated using those examples.

1.1 Related work

The majority of methods for pedestrian detection use one of the following approaches:

- Deformable part model
- Feature extraction and decision tree
- Convolutional Neural Network (CNN)

The following are some representative examples of works using each method.

The method based on DPM presented in Felzenszwalb et al. (2010), uses rigid root and deformable part filters but does not perform well on low- resolution objects. It was the basis for the development of the method called MT-DPM (Yan et al., 2013), that handles resolution differences between objects in the same image. The multi-resolution detection method is trained to learn structural commonness between samples of different resolutions.

Dalal and Triggs (2005), the authors show their studies with the use of locally normalized Histogram Oriented Gradients (HOG) in the task of pedestrian detection. HOG still remains as one of the most effective feature used in the classification task. Dollar et al. (2009) use the concept of feature channels based on an integral image (Viola and Jones, 2004) to gather the information that feeds a decision forest. Paisitkriangkrai et al. (2014), a method for feature extraction based on "spatial pooling" was proposed. The pooling operator selects a unique value that represents a region on the image. In that work, 2 types of image features were used: covariance matrix and Locally Binary Pattern (LBP).

One of the first examples of application with convolutional neural network was presented in Ouyang and Wang (2013). Despite the good results reached in this application, the structure was ineffective in dealing with variations in pedestrian scale. Du et al. (2017), the authors show a CNN structure called F-CNN. In this case, a first CNN generates a large number of candidates having a large number of false positives.

That candidate list is applied to a series of CNNs working in parallel, each CNN specialized to detect pedestrian in a scale range. The use of context information to aid pedestrian detection algorithms is not totally new. In the work presented in Jin et al. (2016), the authors use ground plane information to improve detector accuracy. Camera calibration parameters are used to constrict the floor geometry. Baek et al.

(2016), a Bayesian learning process uses the location of the pedestrians on the training image group to define a Region of Interest (ROI) where the search is performed.

1.2 Proposed Method

Usually a pedestrian detector algorithm receives an image and performs an extensive search in order to locate each true-positive pedestrian that satisfies the search requirements (size, search area, occlusion level).

In that process, a large number of false-positive examples are included in the candidate list. The higher the desired accuracy, the greater the number of false positives in the list, thus the lower the precision. The use of context information can improve this result.

In this work, we propose a novel system that integrates a pedestrian detector with a local context information extractor of localized bounding boxes and respective scores. At the next step, the system extracts the features below each bounding box and the neural network decides whether there is a floor area below each candidate. Candidates that are not standing on a floor area are eliminated from the list as a false-positive example.

1.3 Artificial Neural Network

The Artificial Neural Network used in this work is trained to perform a patch classification into 2 classes: floor and non-floor. The patch size is fixed at 16×16 pixels. This size was chosen through experiments with different patch sizes. Patches larger than 16×16 do not bring any improvement and demand much longer training time. However, patches smaller than 16×16 significantly degrade the result. The ANN is a feed forward-type network.

A typical application of ANN on computer vision uses pixel intensity values in the raw image feeding the ANN input (Rowley et al., 1998), but for texture classification, pixel values show a high level of redundancy. To avoid that effect, image features from the patches are used rather than the raw pixel value.

2. FEATURE EXTRACTION

In the proposed system, the ANN input layer receives data from an intermediate step that transforms the original patch into a set of feature channels. Each channel represents the original patch in terms of a particular feature.

The calculation of the feature channels used in this work was inspired by Dollár et al. (2010). In that system, feature channels are used for pedestrian detection. We used the same feature combination resulting in 10 feature channels extracted from each patch. The feature channels are normalized gradient magnitude (1 channel), histogram of oriented

gradient (6 channels) and LUV color channels (3 channels).

In the histogram of oriented gradient (HOG), the bins represent the orientation angles proposed for this application. The bins accumulate magnitude-weighted votes for gradients at the respective orientation. In our case, we use 6 different orientations, thus resulting in 6 different maps. The normalized gradient magnitude channel represents the actual value of the gradient intensity.

The 3 LUV color channels complete our set of features. Compared to other color space definitions, the LUV space delivered the best results in our experiments.

2.1 Floor Detection

The objective of this work is to improve the performance of pedestrian detection algorithms by using context information of presence of floor area below each pedestrian candidate found by the detector algorithm. Floor area presence can improve confidence of the system by eliminating some false- positive examples found.

At the pedestrian detector output, a list of found pedestrians is presented with annotation of size and position in the form of a Bounding Box (BB).

2.3 Experiments

During the experiments performed in this research, the influence of context information (floor presence) on the result of a pedestrian detection algorithm was evaluated. The approach consists of working with patches collected below the detected pedestrian to identify a floor area that reinforces confidence on the performed detection. The MATLAB Development Environment was used to test the algorithms and to carry out the image manipulations during all experiments performed.

2.4 Ground Plane Identifier Tool

The first step was create a ground plane identifier tool. This tool should work on classifying local patches of images between floor and non-floor classes. A neural network was chosen due to its simplicity and real time response. The training database was gathered from images of the Caltech pedestrian database. We cropped 1632 patches of floor examples and 4235 examples of non-floor examples. These patches were collected from 160 different images. The next step transforms each patch into a vector containing all extracted features. Finally, extra data is added to feature vectors defining the target label for use in the ANN training procedure. Value 0 is the label for non-ground examples and 1 is the label for ground examples.

The network structure that reached the best results has 15 neurons in the first hidden layer and 10 neurons in the second

hidden layer. To prove the neural network efficiency, a second database was created having 113 positive patch examples (floor) and 117 negative patch examples (non-floor). Results of the neural network on this database give an idea of the efficiency of the tool as a ground plane identifier. The neural network classified correctly 100 floor patches (13 missed) and 112 nonfloor patches (5 missed), reaching 92.17% accuracy.

However, these results are not very conclusive to evaluate the task of accurate extraction of ground presence below a detected pedestrian. This is mainly due to occlusion in the actual images. In this schema, the neural network analyzes 3 levels of patches below a Bounding Box delimiting a pedestrian. Floor presence is confirmed if at least one patch gives a positive answer. The result is that we could detect floor presence on 90.13% of pedestrians annotated on the Caltech training group.

3. PEDESTRIAN DETECTION

The remainder of this section describes the tests for evaluating the whole system by integrating the pedestrian detector with context information (floor presence). The ACF-LDCF pedestrian detector algorithm (Nam et al., 2014) was used in the tests.

If at least one patch gives a positive answer for floor, the candidate is confirmed at the final detection list. If no patch gives a positive answer for floor, the candidate is possibly a false-positive and it is eliminated of the final detection list.

The system was used to detect pedestrians in images of 3 sub-groups of the Caltech dataset: the near subgroup, where pedestrians are 80 pixel or taller with no occlusion, the medium sub-group, where pedestrians are between 50 pixel and 80 pixel tall with no occlusion and the reasonable sub-group, where pedestrians are 50 pixel or taller with a low occlusion level.

The performance comparison between algorithms on the Caltech pedestrian benchmark is made using the ROC curve. The ROC curve shows the miss rate performance for the number of False Positives Per Image (FPPI). This comparison method is considered very effective because gives the number of object misses for each false-positive range. Another aspect of system performance relates toruntime. The use of context information caused a 55% increase in the algorithm's runtime. The original ACFLDCF algorithm takes 1445 sec to run on the all 4000 images of the test group. Using context information along with the original algorithm, the runtime reaches 2239 seconds. Nevertheless, yet the system is capable of analyzing approximately 2 frames per

second, making the system useful in many real-time applications.

We compare our method with 2 others that use context information to improve the performance of pedestrian detection algorithms. Jin et al. (2016), authors use the camera information to build a model and eliminate some false-positives based on this model. The method is capable of eliminating some false-positives reaching an improvement of 2.7% in the overall precision.

But at the same time a few true- positives were eliminated. Consequently, the recall was degraded. Baek et al. (2016), authors use a Bayesian learning process to define a search area inside the image. This method eliminates 19.5% of the false-positives, but degrades the miss rate by 2.8%. The great advantage in this method is the computational time gain. Performing the search in a reduced area, this method requires only 70% of the computational time of a conventional method. Table 1 shows the performance comparison between these 2 method and ours.

4. CONCLUSION

In this study, we introduced a system integrating a pedestrian detection algorithm and an ANN for ground plane detection. The ANN helps the pedestrian detection algorithm by eliminating some false-positive examples on the pedestrian candidate list that do not have a visible ground plane below the bounding box that delimits the pedestrian. The ground plane identification works as context information that aids a pedestrian detection algorithm improving its performance.

In order to prove the effectiveness of the system, we perform tests in 3 sub-groups of the Caltech database. The best improvement (7.0%) was reached in the reasonable sub-group where pedestrians are 50 pixel or taller with a low occlusion level.

Results of this research indicate that the context information gathered from the scene aids the object detection task. The connection between the ground plane detected by the ANN and the actual pedestrians on the Caltech image database was proved by using the training image group where the location of pedestrians is known. The ANN was able to detect the ground plane for 90.13% of pedestrians in the images. In the future, this research will evaluate other elements in the scene such as cars, trees and other pedestrians, that could provide useful context information for the pedestrian detection task.

REFERENCES

1. Abowd, G. D., A.K. Dey, P.J. Brown, N. Davies and M. Smith et al., 1999. Towards a better

understanding of context and context-awareness. Proceedings of the International Symposium on Handheld and Ubiquitous Computing (HUC' 99). Springer, Berlin, Heidelberg, pp: 304-307. DOI: 10.1007/3-540-48157-5_29

2. Baek, J., S. Hong, J. Kim and E. Kim, 2016. Bayesian learning of a search region for pedestrian detection. Multimedia Tools Appli., 75: 863-885. DOI: 10.1007/s11042-014-2329-z
3. Candido, J. and M. Marengoni, 2017. Ground plane segmentation using artificial neural network for pedestrian detection. Proceedings of the International Conference Image Analysis and Recognition, Springer, Cham, pp: 268-277. DOI: 10.1007/978-3-319-59876-5_30
4. Conrad, D. and G.N. DeSouza, 2010. Homographybased ground plane detection for mobile robot navigation using a modified EM algorithm. Proceedings of the IEEE International Conference on Robotics and Automation, May, 3-7, IEEE Xplore press, Anchorage, USA, pp: 910-915. DOI: 10.1109/ROBOT.2010.5509457
5. Dalal, N. and B. Triggs, 2005. Histograms of oriented gradients for human detection. Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Jun. 20-25, IEEE Xplore press, USA, pp: 886-893. DOI: 10.1109/CVPR.2005.177
6. Dollár, P., C. Wojek, B. Schiele and P. Perona, 2009. Pedestrian detection: A benchmark. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, Jun. 20-25, IEEE Xplore press, USA, pp: 304-311. DOI: 10.1109/CVPR.2009.5206631
7. Dollár, P., S. Belongie and P. Perona, 2010. The Fastest Pedestrian Detector in the West. In: Proceedings of the British Machine Vision Conference, Labrosse, F., R. Zwiggelaar, Y. Liu and B. Tiddeman, (Eds.). BMVA Press, pp: 68.1-68.11.
8. Dollar, P., Z. Tu, P. Perona and S. Belongie, 2009. Integral Channel Features. In: Proceedings of the British Machine Conference, A. Cavallaro, S. Prince and D. Alexander (Eds.), BMVA Press, pp: 91.1-91.11.
9. Du, X., M. El-Khamy, J. Lee and L. Davis, 2017. Fused DNN: A deep neural network fusion approach to fast and robust pedestrian detection. Proceedings of the IEEE Winter Conference on Applications of Computer, Mar. 24-31, USA, IEEE Xplore press, USA, pp: 953-961. DOI: 10.1109/WACV.2017.111
10. Felzenszwalb, P.F., R.B. Girshick, D. McAllester and D. Ramanan, 2010. Object detection with discriminatively trained part-based models. IEEE Trans. Pattern Analysis Machine Intelligence, 32: 1627-1645. DOI: 10.1109/TPAMI.2009.167
11. Haykin, S., 1994. Neural Networks, a Comprehensive Foundation. Macmilan, ISBN-10: 0023527617
12. Jin, C., X. Cui, T. Woo and H. Kim, 2016. Method for pedestrian detection using ground plane constraint based on vision sensor. Proceedings of the International Conference on Electronics, Information and Communications, Jan. 27-30, IEEE Xplore press, Vietnam, pp: 1-4. DOI: 10.1109/ELINFOCOM.2016.7562937
13. Nam, W., P. Dollár and J.H. Han, 2014. Local decorrelation for improved pedestrian detection.

Advances in Neural Information Processing Systems, pp: 424-432.

14. Ouyang, W. and X. Wang, 2013. Joint deep learning for pedestrian detection. Proceedings of the IEEE International Conference on Computer Vision, Dec. 1-8, IEEE Xplore press, Australia, pp: 2056-2063. DOI: 10.1109/ICCV.2013.257
15. Paisitkriangkrai, S., C. Shen and A. Van Den Hengel, 2014. Strengthening the Effectiveness of Pedestrian Detection with Spatially Pooled Features. In: Computer Vision – ECCV 2014, Fleet, D., T. Pajdla, B. Schiele and T. Tuytelaars (Eds.), Lecture Notes in Computer Science, Springer, Cham.

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ANALYTICAL STUDY OF GEOPOLYMER CONCRETE: A SYSTEMATIC REVIEW

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Abstract- As public awareness of environmental injustice has grown in recent years, the construction community's interest in using waste or recycled materials in concrete has risen as well. If we look around us, we can see a lot of materials that we consider waste but are opportunities. Alkali-activated concrete or inorganic polymer concrete are other names for geopolymer concrete.Geopolymer is a newly developed construction material that allows for large-scale use of fly ash without the use of cement. Compressive strength of Rice Husk Ash is based on geopolymer mortar which depends on the strength of geopolymer binder it is an excellent bonding between geopolymer binder and aggregate. Rice Husk Ash's compressive strength is based on geopolymer mortar, which is dependent on the strength of the geopolymer binder and provides excellent bonding between the binder and the aggregate. This research will benefit the environment by reducing the amount of Rice Husk Ash that will be disposed of through incineration and land filling. Within 7 days of casting, the strength of geopolymer concrete has been demonstrated.
Keywords: Recycled aggregate Compressive Strength Test.

1 INTRODUCTION

Numerous studies on geopolymer concrete have been conducted in the past. The use of alkaline solution with RHA/Fly ash in concrete, also known as geopolymer concrete, has been the subject of most research papers published in various journals. Rice husk's types, properties, benefits, and uses have all been discussed in the literature, but there is currently no information available for fully replacing cement in (geopolymer) concrete.

Because of the large demand for cement in concrete manufacturing, there are many opportunities to find a replacement cement, as well as the increasing rate of environmental pollution and the consideration of sustainable factors, a study of geopolymer concrete based on RHA (fully replaced cement) is required. In this paper, I'd like to look at the physical properties of geopolymer concrete, such as workability, compressive strength, tensile

strength, and flexural strength. The applications are identical to those of cement concrete. However, this material has yet to be widely adopted for a variety of applications.

Pavements, retaining walls, water tanks, and precast bridge decks have all been built with this concrete. Geopolymer concrete has been used in a variety of applications, including earth-retaining and water-containment structures.

1.1 Objectives of Study

- To determine the Optimum percentage of alkaline solution (NaOH + Na2SiO3) in Rice Husk Ash for Geopolymer to be used.
- To analysis the final & initial setting time of geopolymer concrete
- To check the Compressive & Flexural strength of Geopolymer concrete based on RHA at 50˚C curing temperature.

2 METHODOLOGY

In the laboratory, coarse aggregates (20mm), fine aggregates, Rice Husk Ash, and alkaline solution were used to make Geopolymer Concrete (Sodium Hydroxide and Sodium Silicate). Aluminate and silicate bearing materials are combined with a caustic activator to create geopolymer concrete. Waste materials like fly ash or slag from iron and metal production, as well as rice husk ash, are commonly used, resulting in a cleaner environment. Five different mixture proportions were formulated for making geopolymer concrete specimens based on that research.

A. Tests on aggregates

The following tests on aggregates were performed:

a.Impact Test

The aggregate impact test is used to determine how resistant aggregates are to impact. Aggregates that pass through a 12.5 mm sieve and are retained on a 10 mm sieve are placed in a cylindrical steel cup with an internal diameter of 10.2 mm and a depth of 5 cm that is attached to the impact testing machine's metal base. The material is layered in three layers, each of which is tamped for a total of 25 blows. A metal hammer weighing 13.5 to 14 kg is suspended from vertical guides with a free fall of 38.0 cm, and the test specimen is subjected to 15 blows.

b.Shape Test

The flakiness index of aggregate is the percentage of aggregate mass whose least dimension is less than 0.6 times the mean dimension. The flakiness test is applicable to aggregates larger than 6.3 mm in size.

Elongation Index: The aggregate elongation index is the percentage

of particles by weight whose longest dimension (i.e. length) is greater than 1.8 times the mean dimension.

c.Specific gravity and water absorption test

Aggregate specific gravity and water absorption are important properties that must be considered when designing concrete and bituminous mixes. A solid's specific gravity is the ratio of its mass to that of an equal volume of distilled water at a given temperature.

d.Sieve Analysis

The particle size distribution of course and fine aggregates can be determined using sieve analysis. The aggregates are sieved according to IS: 2386 (Part I) – 1963. We do these by-passing aggregates through different sieves that have been standardized by the IS code, and then collecting different sized particles left over from different sieves.

B Tests on cement

The following tests on cement were performed:

a.Fineness Test

Fineness is defined as the average size of cement grains. It is used to determine the average grain size of cement. The finer the cement, the greater the surface area available for hydration and, as a result, the greater the cement's strength.

b.Consistency Test

The consistency test is used to determine how much water is needed to make a normal-consistency cement paste.

c.Setting Time Test

The time it takes for cement to set is divided into two categories: initial setting and final setting. The initial setting time of cement refers to the point at which it begins to stiffen. The point at which cement becomes fully non-workable is known as the final setting time.

d.Soundness Test

The soundness of cement is determined by measuring the volume change in the cement after it has been set. The greater the volume changes, the more cracks and other failures will occur.

e.Strength Test

Compressive strength test of cement is performed on size 70.6*70.6*70.6 mm3 mold. Cement with higher compressive strength is better.

C Tests on concrete

The following tests on aggregates were performed:

a.Slump Cone Test:

The purpose of a concrete slump test, also known as a slump cone test, is to determine the workability or consistency of a concrete mix prepared in the laboratory or on the job site as the work progresses. A concrete slump

test is performed from batch to batch to ensure that the quality of the concrete is consistent throughout the construction process.

b.Compressive Strength Test:

- To determine the compressive strength and durability effects of concrete, 150 mm× 150 mm × 150 mm size concrete cubes were cast and tested in accordance with IS: 516-1959.
- All strength tests were conducted using 2000 kN compression testing machine. Cube moulds of size 150x150x150 mm were used.

Figure 1 Geopolymer Concrete Cubes

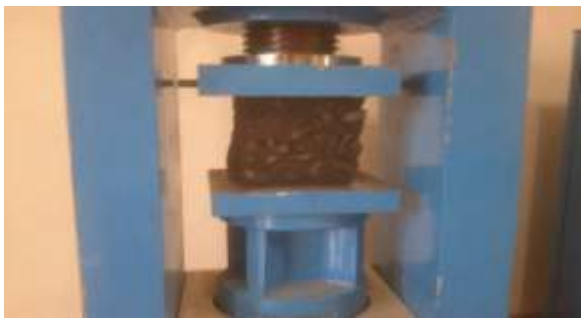

Figure 2 Compressive Strength test of geopolymer Concrete

Figure 3 Compressive Strength test of geopolymer Concrete

3 CONCLUSION

This research will benefit the environment by reducing the amount of Rice Husk Ash that will be disposed of through incineration and land filling. Within 7 days of casting, the strength of geopolymer concrete has been demonstrated. The alkaline solution to source material ratio is kept at 0.8 for better workability. The early-age strength gain is best utilized in the precast industry, where steam curing or heated bed curing is common practice and used to increase the rate of production elements.

Box culverts, sewer pipeline products, railway sleepers, building products such as fire and chemically resistant wall panels, paving blocks, refractory bricks, and other pre-cast structures can all benefit from geopolymer technology.

Conclusion:

- The initial setting time and final setting time ranged

from 50 minutes to 120 minutes for Rice Husk Ash Geopolymer.

- The highest Compressive strength of the specimen produced by the 0.8 mass ratio (Activator/source material).
- The strenght of geopolymer mortar are 28 Mpa.
- The Compressive strength is varying from 20 Mpa – 33s Mpa.
- The Flexural strength of geopolymer concrete is 3.86 Mpa.

REFERENCES

1. Shetty MS. Concrete technology. S. chand & company LTD. 2005 May: 420-53.
2. Gambhir ML. Concrete technology: theory and practice. Tata McGraw-Hill Education; 2013.
3. Gambhir ML. Concrete manual: laboratory testing for qualifying control of concrete. Dhanpat Rai. & sons, New Delhi. 1987.
4. Sudheer, K. S., Kumar, P. P. S., Reddy, M. A. K., & Rao, V. R. A Study on Durability of Concrete by Partial Replacement of Cement with Bentonite. 2017,10(6): 898-904.
5. Vyas C M, Patel I, Bhatt Dr. Durability Properties of Concrete with Partial Replacement Of Natural Aggregates By Recycled Coarse Aggregates. Research and Development (IJCSEIERD). 2013 Jun; 3(2):125-34.
6. Kumar T K, Priyanka N. Experimental study on properties of strength and durability of concrete by partial replacement of fine aggregate with copper slag and cement with eggshell powder for M30 and M40 grade concrete. International Journal of Professional Engineering Studies 2017 May; 8(4):94-103.
7. Swaroop AH, Venkateswararao K, Kodandaramarao P. Durability studies on concrete with fly ash & Ggbs. International Journal of Engineering Research and Applications. 2013 Jul; 3(4):285-9.
8. Shah DS, Pitroda J. An experimental study on durability and water absorption properties of pervious concrete. International Journal of Research in Engineering and Technology. 2014 Mar;3(03):439-44.
9. Karakoç MB, Türkmen İ, Maraş MM, Kantarci F, Demirboğa R. Sulfate resistance of ferrochrome slag based geopolymer concrete. Ceramics International. 2016 Jan 1;42(1):1254-60.
10. Daisy Angelin P, Ravi Kishore P. Durability Studies on Concrete with Manufacturing Sand As A Partial Replacement of Fine Aggregate In HCL Solution. International Journal of Engineering Research and Development. 2015; 7:44-50.
11. Haldive SA, Kambekar AR. Experimental study on combined effect of fly ash and pond ash on strength and durability of concrete. International Journal of Science and Engineering Research. 2013 May 9; 4(5):81-6.
12. Midhu Jolly and Prof. Praveen Mathew A Study on Durability Properties of Scc And Conventional Concrete with Recycled Coarse Aggregate. IOSR Journal of Mechanical and Civil Engineering. 2016 Sep-Oct; 13 (5):35-41.
13. Almograbi M. Durability study of lightweight concrete material made from date palma seeds (DPS). High Performance Structures and Materials V. 2010 Jul 1;112:69.

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AN APPLICATION ON OPTIMAL OPERATING SYSTEM FOR DELTA IV UGHELLI GAS TURBINE PLANT

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Abstract- The possibility of improving the overall efficiency of 100MW Delta IV Ughelli gas turbine power plant unit is presented. The study used Non-Dominated Sorting Genetic Algorithm (NSGA) to minimize the energy destruction by optimally adjusting the operating parameters (decision variables). The adjusted operating variables were compressor pressure ratio rp, compressor isentropic efficiency ηic, turbine isentropic efficiency ηit, turbine inlet temperature T3, inlet flow rate of air a mass flow rate of fuel. The ambient temperature and pressure were held constant at 303K and 1.013 bars respectively because of location limitations. The optimization code was written in MATLAB programming language. The decision variables (constraints) were obtained randomly within the admissible range.
Keywords: Optimization, Genetic Algorithm, Energy Destruction.

1. INTRODUCTION

Restructured and liberalized power sectors promote increased competition among players in the sector. Deregulated energy markets require existing power plants to improve their performance in order to attain high thermal efficiency and reliability, so as to operate at low generation cost. To reduce cost during the entire operation time of a plant, selection of optimal operating parameters in different load situations is of an utmost importance. Optimal operating parameters will bring about reduction of irreversibility's, which is a vital condition for better plant performance. Energy analysis has been found as a useful method in design, evaluation, optimization and improvement of thermal power plants. It has proven to be a powerful tool in the thermodynamics analysis of energy systems. Energy analysis gives a quantitative and illustrative description of the convertibility of different energy forms. It asserts the fact that energy cannot be destroyed but the quality can be degraded such that it reduces its ability to do useful work.

As it is known, the processes in all real energy conversion systems are irreversible and a part

of the energy supplied to the total system is destroyed. The concept of energy is very useful for the identification of losses and irreversibility in the system by providing a more detailed tracking mechanism for energy usage. The real inefficiencies of a system are energy destruction occurring within the system boundaries and energy losses, which are energy transferred out of the system that are not further used in the overall system. In this study, Genetic Algorithm (GA) was applied to minimize the energy destruction by optimally adjusting the operating parameters. The workability of GA is based on Darwinian's theory of survival of the fittest. They were originally designed as simulatorsbut have proven to be a robust optimization technique. The term robust denotes the ability of GA in finding the global optimum or a near-optimum for any optimization problem.

GA may contain a chromosome, a gene, set of population, mutation and selection. Genetic algorithm uses two operators to generate new solutions from existing ones: crossover and mutation. The crossover operator is the most important operator of GA. In crossover, two chromosomes called parents are combined to form new chromosomes, called off-springs. The parents are selected among the existing chromosomes in the population with preference to fitness. This enables the off-springs to inherit good genes making them better than their parents. By iteratively applying the crossover operator, genes of good chromosomes are expected to appear more frequently in the population, eventually leading to convergence to an overall good solution. The mutation operator introduces random changes into the characteristics of the chromosomes.

The aim of mutation is to introduce new genetic material into existing individual; that is, to add diversity to the genetic characteristics of the population. The population which is created randomly at the onset is called initial population. The size of this population may vary from several tens of chromosomes (strings) to several thousands. The criterion applied in determining an upper bound for the size of population is that further increase does not result in improvement of near-optimal solution. The upper bound for each problem is determined after some test runs. For most applications, the best population size lies within the limits of 100 - 1,000 strings. On the basis of the optimality (measure of goodness) value, an objective function value or fitness value is assigned to each string. This fitness usually set as the amount of optimality of each string in the population divided by the average population optimality.

Effort is always made to ensure that the fitness value is a positive number. It is possible that a certain string does not reflect an allowable condition. For such a case, the fitness of the string is penalized with a very low value, indicting in such a way to the GA that it is not a good string. Similarly, other constraints may be implemented in the GA. The "operators", which are kinds of population transformation devises, are applied to the population. As a result of these operators, a new population is created, that will hopefully consist most optimal strings. The old population is replaced by new one. A predefined stopping criterion, usually maximum number of generations to be performed by the GA is checked. If the criterion is not satisfied, a new generation is started, otherwise, the GA terminates.

The objective of this study is to evaluate the possibility of improving the overall thermal efficiency of the 100MW gas turbine power plant unit using GA to minimize the energy destruction by optimally adjusting the operating parameters. The parameters are: compressor pressure ratio, compressor isentropic efficiency, turbine isentropic efficiency and turbine inlet temperature. Energy can be divided into four distinct components. The two important ones are physical energy and chemical energy. In this study, the other components, that is, kinetic energy and potential energy were assumed negligible as elevation and speed have negligible changes in the system under investigation.

2. MATERIALS AND METHOD

The data used for this study were measured values recorded in the station's operation logbook for the period of January 2005 to December 2014 [14]. Parameters considered during the data collection were the pressures, temperatures and mass flow rates at various points. In the analysis of the data, daily, monthly and yearly mean values of the parameters were computed using MS Excel worksheet. The simplified schematic diagram of the power plant, depicting relevant components while diagram.

3. GENETIC ALGORITHM OPTIMIZATION

The optimization is done using Non-Dominated Sorting Genetic Algorithm (NSGA) proposed by. The algorithm eliminates higher computational complexity, lack of elitism and the requirement for specifying sharing parameter. The developed GA code selects the decision variables in such a way to decrease the objective function. The flowchart of the algorithm is shown in. The optimization code was written in MATLAB programming language. The decision variables were generated

randomly within the admissible range. The optimal values of the decision variables (constraints) were obtained by minimizing the objective function. The variation of the objective functions with the number of generations.

The first 50 generations gave higher variation of the decision variables than the other generation numbers because searching in the first intervals were more sensitive. Thus, after about 70 generations, the objective function finds the real decision variables. From 150 generations, the change in the results obtained started giving relatively lower values under each iteration. The convergence (that is, no noticeable change in the value) of the objective function becomes obvious from 250 generations. However, the choice of 300 generations was to ensure that the search space was fully utilized without putting strain on the computation time and complexity. The ambient conditions were maintained at 303K and 1.013bar because of location limitations. Several researchers have reported that ambient conditions have major impact on the plant's performance.

Hence, various techniques have been proposed so far to enhance the thermal efficiency or power output of gas turbine power plant by reducing the compressor inlet air temperature. These techniques include: evaporative cooling, fogging or with the help of absorption and mechanical chillies. However, the performance of evaporative media coolers is constrained in high relative humidity conditions such as that, encountered in Nigeria. And also, such coolers require de-mineralized water supply while electrically driven mechanical vapour-compression chillies consume significant amount of electrical power. Application of coatings to the compressor blades would be of help in improving its performance. Compressor blades coating provide smoother and more aerodynamic surfaces, which will lead to increased compressor efficiency. GECC- 1 coating combines the effects of an aluminium-coating to prevent corrosion and a ceramic top-coat to prevent erosion.

4. CONCLUSION

The optimization of the plant's operating parameters (decision variables) has been carried out using NSGA. The decision variables were randomly generated within the admissible range. The optimal values of the decision variables (constraints) were obtained by minimizing the objective function. The developed GA code selects the decision variables in such a way to decrease the objective function. The convergence of the objective function becomes obvious from 250 generations. However, the choice of 300 generations was to

ensure that the search space was fully utilized without putting strain on the computation time and complexity. The ambient conditions were maintained at 303K and 1.013bar because of location limitations.

Optimized values revealed that and 3 T were increased from their base values by 15.98% , 5.37% , 4.85% and 12.20% respectively while were reduced from their base values by 16.67% and 5.54% respectively. Increased p r results in higher thermal efficiency whereas increased guarantees less energy destruction in the compressor. Suggested application of coatings to the compressor blades will increase the compressor efficiency. Increased it h and 3 T contribute greatly to the reduction of energy destruction in the combustion chamber as well as reduction in the cycle fuel consumption. Applying thermal barrier coatings to the hot sections of the gas turbine unit will increase the parts lifespan at the designed firing temperature or allow an increased firing temperature while still maintaining the original designed lifespan of the parts. Reduced contributed immensely to the reduction of the total energy destruction.Directly imply fewer emissions from the plant and consequently reduction in the gas turbine's negative impact on the environment.

REFERENCES

1. Gorji-Bandpy, M. and Goodarzian, H. (2011); Exergoeconomic Optimization of Gas Turbine Operating Parameters using Genetic Algorithms: A Case Study, Thermal Science, Vol. 15, No. 6, pp. 129-136.
2. Abam, F. I.; Ugot, I. U. and Igbong, D. I. (2012); Effect of Operating Variables on Exegetic Efficiency of an Active Gas Turbine Power Plant, Journal of Emerging Trends in Engineering and Applied Sciences, Vol. 3, No. 1, pp. 131-136.
3. Oyedepo, S. O.; Fagbenle, R. O. and Adefila, S. S. (2017); Modelling and Assessment of Effect of Operating Parameters on Gas Turbine Power Plant Performance using First and Second Laws of Thermodynamics, American Journal of Engineering and Applied Sciences, DOI: 10.3844.
4. Ighodaro, O. O. and Aburime, B. A. (2011); Exergetic Appraisal of Delta IV Power Station Ughelli, Journal of Engineering Trends in Engineering and Applied Sciences, Vol. 2, No. 2, pp. 216-218.
5. Naserian, M. M.; Farahat, S. and Sarhaddi, F. (2016); Exergoeconomic Analysis and Genetic Algorithm Power Optimization of an Irreversible Regenerative Brayton Cycle, Energy Equipment and Systems, Vol. 4, No. 2, pp. 189-203.
6. Khosravi, A.; Gorji-Bandpy, M. and Fazelpour, F. (2014); Optimization of a Gas Turbine Cycle by Genetic and PSO Algorithms, Journal of Middle East Applied Science and Technology (JMEAST), Issue 21, pp. 706-711.
7. Gupta, M and Kumar, R. (2015). Optimization of an open cycle Gas Turbine Power Plant using Exergue economics. International Journal of Recent Advances in Mechanical Engineering, Vol. 4. No. 4, pp. 95-104.

8. Javadi, M. A. and Ghomashi, H. (2016); Thermodynamics Analysis and Optimization of Abadan Combined Cycle Power Plant, Indian Journal of Science and Technology, Vol. 9, No. 7, pp. 60-72.
9. Henry, E. O. and Albert, A. I. (2013); Exergetic Analysis of Omotosho Phase 1 Gas Thermal Power Plant, International Journal of Energy and Power Engineering, Vol. 2, No. 5, pp. 197-203.
10. Husnain, N.; Khan, W. A.; Qureshi, S. R.; Siddiqui, F. A.; Wang, E. and Mehmood, A. (2017); Exergetic and Energetic Analysis of a 210 MW Thermal Power Plant in Pakistan, Technical Journal, University of Engineering and Technology (UET) Taxila, Pakistan, Vol. 1, pp. 66-77.

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AN ANALYTICAL RESEARCH BASED ON EFFECT OF ZYCOTHERM ON THE PROPERTIES OF WARM MIX ASPHALT

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Abstract- In this study bitumen was modified with Zycotherm additive to prepare Warm Mix Asphalt. Various standard tests were performed with neat bitumen and Zycotherm modified bitumen. The objective of the study was to know the effect of Zycotherm on the properties of bituminous mix. The effects of the Zycotherm Additive on Dense Bituminous Mix (Grade 1) ware tested by the Marshall Stability Test. Various properties such as Bulk Density, Volume of air voids, Voids in Mineral Aggregates, Voids Filled with Bitumen, Stability and Flow were determined from Marshall Stability Test. Comparisons were made between mixes prepared with base bitumen & Zycotherm modified bitumen at different temperatures.

Keywords: Additive, Zycotherm, Warm Mix Asphalt, Marshall Stability, DBM.

1 INTRODUCTION

The asphalt industry is making endless efforts to reduce its emissions by reducing the temperatures of mixing and compaction of asphalt mixes without affecting the mix properties. Rising fuel prices, global warming, and strict environmental regulations have led to an interest in Warm Mix Asphalt technology as a way to reduce energy consumption and emissions associated with conventional hot mix asphalt production.

Warm Mix Asphalt technology is a generic term used for variety of technologies that allow Hot Mix Asphalt (HMA) pavement material producers to reduce temperatures at which the material is mixed and placed on the road.

In recent years, the asphalt industry has explored the Warm Mix Asphalt technology as a way to reduce the mixing and compaction temperatures of asphalt mixtures. Warm Mix Asphalt is a mixture of asphalt mixed at lower temperatures than conventional hot asphalt. The mixing temperatures of the Warm Mix Asphalt range from 100 to 140° C (212 to 280 ° F) as compared to the mixing temperatures of 150 to 180 ° C (300 to 350 ° F) of Hot Mix Asphalt.

2 OBJECTIVE

The objective of this study to determine the effects of Zycotherm additive on DBM Mixes (Grade-1) prepared at different temperatures and their comparison with conventional HMA mixes. Mid-size gradation was adopted for both HMA and WMA mixes. Thestudy included preparation and testing of laboratory specimens for Marshall Test of HMA mix at 155°C and WMA mix at temperature ranging from 100 to 140°C with additive dosage rate of 0.1% by weight of bitumen.

3 MATERIALS

1. Bitumen

Plain & Zycotherm modified bitumen of Viscosity Grade 30(VG-30) was used for the preparation of specimens. The basic test results of the bitumen are tabulated in Table 1.

Table 1 Properties of Plain & Modified Bitumen

S.No.	Test	Results		Range as Per IS:73-2013
		Plain Bitumen	*Modified Bitumen*	
1	Penetration, at 25°C, (0.1mm)	55	61	Min. 45
2	Softening point (R&B), °C	48	49	Min. 47
3	Ductility (cm)	79	92	Min. 75 cm
4	Flash Point °C	250	280	Min. 225
5	Specific Gravity	1.01	1.02	0.97-1.02

2. Aggregates

The aggregates with desired strength, hardness & toughness were selected as such aggregates produce higher stability. The properties of bituminous mix very much depend on the aggregate size and their grain size distribution. The requirements of gradation for various layers of different bituminous courses has been specified by Ministry of Roads Transport & Highways (MoRTH 5th revision).

Table 2 Properties of Coarse Aggregates

S.No.	Test	Results	Range as MoRTH
1.	Aggregate Impact Value, %	16.04	Max. 27%
2.	Aggregate Crushing Value, %	16.37	--
3.	Combined Flakiness & Elongation Index, %	22.33	Max. 35%

4.	Specific gravity	2.7	--
5.	Water Absorption, %	0.8	Max. 2%
6.	Los Angeles Abrasion Value, %	25.32	Max. 35%

3. Zycotherm

ZycoTherm is a Warm Mix Asphalt additive which is developed by ZydexIndustries, Gujarat, India. It is an odour freechemical warm mix additive that offers lower production and compaction temperatures, while simultaneously enhancing the moisture resistance of pavements by serving as an antistrip. Due to its built-in antistripmechanism itacts as anantistrip as well as a warm mix additive. Zycotherm is compatible with both modified & unmodified binders. For the study the additive dose was kept the same for all mixtures i.e. 0.1% by weight of bitumen

The physical properties of Zycotherm are shown in Table 3.

Table 3 Properties of Zycotherm

S.No.	Property	
1.	Physical Form	Liquid
2.	Color	Pale Yellow
3.	Density	1010 kg/m^3
4.	Specific Gravity	1
5.	Viscosity	300 CP (25°C)
6.	Flash Point	>80°C
7.	Odor	No Odor
8.	Solubility in Water	Soluble in water
9.	pH	10 % Solution in water neutral or slightly acidic

Since the maximum size of aggregate is more than 26.5 mm in DBM Grading-1 the conventional Hot Mix Asphalt Specimens for DBM Grading-1 were prepared as per Modified Marshall Method of bituminous mix design. Total weight of specimen was taken as 4050 grams for preparation of Modified Marshall specimen for grading-1. Then required weight of aggregate of desired gradation were weighed and heated up to 175 to 190°C. Bitumen (virgin VG 30) was separately heated up to 121 to 125°C with the first trial percentage of bitumen (say 3.5 % by

weight of the mineral aggregates). The calculated amount of bitumen was mixed with aggregate till proper coating was achieved. The mix was placed in the mould (152.4mm diameter and 95.25mm thick) and compacted by giving 112 blows on each face. The mould was taken out and kept under normal temperature for 24 hours. The height and weight of the specimen were measured. It was immersed in a water bath kept at constant temperature of 60°C for 30 minutes and after that it was taken out for testing in the Marshall testing machine. The bitumen content was varied in the next trial by +0.5% and the above procedure was repeated for bitumen content up to 5.5%.

For the determination of Optimum Binder Content, the average value of bitumen contents corresponding to maximum stability, maximum unit weight & 4% air voids were considered.

Warm Mix specimens were prepared similar to Hot Mix Asphalt Specimens. For DBM Grading-1, Warm Mix Modified Marshall specimens were prepared similar to Hot Mix Modified Marshall Specimens except that instead of virgin bitumen, modified bitumen was used as binder material and the mixing & compacting temperatures were varied from 100°C to 140°C. For each bitumen content & temperature three test specimens were prepared.

The specifications for DBM Grade-1 as per MoRTH 5th Revision are given in Table 4.

Table 4 DBM Grade-1 Specifications (MoRTH 2013)

Mix Design Properties	Requirements for DBM Grade-1
Minimum Stability (KN at 60°C)	20.25 KN
Marshall Flow (mm)	3 mm (Min.)
Air Voids (%)	3-5%
Voids Filled with Bitumen VFB (%)	65-75%
Voids in Mineral Aggregates, VMA (%) (Min.)	10-12%
Marshall Quotient (Stability/Flow)	2-5

To obtain Optimum Binder Content (OBC) graphs were plotted between bitumen content & Marshall stability, density & air voids. The relationship between these Marshall Properties & bitumen content for DBM Grade-1 specimens prepared with neat bitumen at 155°C& WMA

specimens prepared with 0.1% Zycotherm at temperature range 100°C to 140°C are shown in Fig. 1 to 3.

Figure 1 shows the variation in Marshal Stability for incremental bitumen content with HMA and WMA mixes prepared with 0.1% Zycotherm for DBM grade-1 of layer thickness 75-100 mm. According to MORT&H specification, all the mixes of HMA and WMA satisfy the minimum stability criteria of 20.25 KN at bitumen content of 4% & above. In accordance with the figure, for binder content 4.5 %, HMA had stability of 23.54 KN, at the same binder content Warm Mix Asphalt specimens prepared with Zycotherm had maximum stability of 28.23 KN at 120°C. For binder content 5.50%,

HMA has stability of 21.10 KN, at the same Warm Mix Asphalt specimens prepared with Zycotherm has maximum stability of 24.16 KN which is greater than that all type of mixes. From the overall observation, it can be said that Warm Mix Asphalt specimens prepared with Zycotherm is preferred as it has the higher stability at each bitumen content.

Bulk Densities are within the desired range. At the bitumen content 4.50% Bulk Density for all Warm Mix Asphalt Specimens is higher than HMA which indicates the higher rate of compaction. Even at 5.50% bitumen content the bulk densities of all Warm Mix Asphalt Specimens are higher than HMA.

Considering the overall behaviour, Warm Mix Asphalt specimens prepared with Zycotherm shows the higher bulk density at the bitumen content of 4.50% and 5.50% but the bulk density gets reduced as the bitumen content increases.

In the present investigation for 3% air voids the bitumen content was found to be 5.80% for HMA mix. At the same time for 4% air voids, the bitumen content was found to be 4.80% for HMA mix & 4.50% for WMA specimens.

From the study it was found that WMA specimens prepared with Zycotherm is succeeded to perform with same compaction as of HMA mix, significantly the compaction effect at 4.50% bitumen content found to be same for both mixes. By this it was found that rearrangement of particle succeeds in WMA specimens prepared with Zycotherm at 4.50% bitumen content as same of HMA mix at slightly higher bitumen content of 4.6%.

4 CONCLUSIONS

On the basis of the detailed study carried out on the effects of Zycotherm on the performance of bitumen & WMA specimens prepared at different temperatures and its comparison with the performance of HMA specimens prepared with neat bitumen the following conclusions are drawn:-

- The properties of modified bitumen shown in Table 1, satisfies the requirement of Viscosity value, Penetration value, softening point value and Ductility

value as per the Requirement of IS 73-2013.

- Conventional test shows that Zycotherm additive increases penetration value of base bitumen and there was a slight increase in softening point of bitumen with addition of Zycotherm additive. Zycotherm additive tends to increase conventional properties of bitumen.
- The Marshall Stability value of HMA specimens produced at 155°C has good stability values. When compared with HMA specimens, the stability and Marshall Properties of WMA specimens prepared at 120°C for aggregate grading-1 were improved by the addition of Zycotherm at an additive dosage rate of 0.1% by weight of the binder.
- Zycotherm improved the bulk density of the mix by 2% for Grading-1. Hence 120˚C temperature with additives shows better and maximum bulk density.
- Zycotherm slightly reduced OBC of WMA specimens as compared to HMA specimens.
- Warm Mix Asphalt produced with 0.1% Zycotherm at 120°C can be used in place of conventional HMA for pavement construction.

REFERENCES

1. Vinod D. Ninawe and Shashikant A. Deshmukh, "Laboratory Evaluation of Warm Mix Asphalt", International Journal of Advance Research in Science and Engineering, vol.6, pp. 259-268, July 2017.
2. Tejash Gandhi, "Effects of Warm Asphalt Additives on Asphalt Binder and Mixture Properties" Ph.D Dissertation, The Graduate School of Clemson University, May 2008.
3. Paltasingi Venkata Raju, M Udaya Sri, PMS Satish Kumar and Sumathi Misro, "Experimental Study on Bituminous Mixes by Using Zycotherm", International Journal of Scientific Development and Research, vol. 3, 71-83, January 2018.
4. IS: 73 (2013), "Paving Bitumen – Specification", Bureau of Indian Standards, New Delhi.
5. IS: 1203 (1978), "Methods for Testing Tar & Bituminous Materials: Determination of Penetration", Bureau of Indian Standards, New Delhi.
6. IS: 1205 (1978), "Methods for Testing Tar & Bituminous Materials: Determination of Softening Point", Bureau of Indian Standards, New Delhi.
7. IS: 1208(1978), "Methods for Testing Tar & Bituminous Materials: Determination of Ductility", Bureau of Indian Standards, New Delhi.
8. IS: 2386 (Part 1) – 1963 (Reaffirmed 2002), "Methods of Test for Aggregates for Concrete – Particle Size and Shape", Bureau of Indian Standards, New Delhi.
9. IS: 2386 (Part 3) – 1963 (Reaffirmed 2002), "Methods of Test for Aggregates for Concrete – Specific Gravity, Density, Voids, Absorption and Bulking", New Delhi.
10. IS: 2386 (Part 4) – 1963 (Reaffirmed 2002), "Methods of Test for Aggregates for Concrete – Mechanical Properties", Bureau of Indian Standards, New Delhi.
11. Ministry of Road Transport and Highways (2013), "Specifications for road and bridge works (Fifth Revision)", Indian Road Congress, New Delhi.

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AN APPLICATION OF WEB, LINUX AND WINDOWS SERVER: A STUDY

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Abstract - Cyber criminals usually request money to restore the files, for the Samsam for Windows ransomware case, the attacker intervenes the organization's network via SSH authenticates to the JBoos Server. From the study carried out it can be concluded with a matrix of analysis, ransom ware attacks of several families CTB-loker, Crypto Wall 4.0, Linux. Enconder and Fair Ware and a list of tools for early warning against ransomware attacks seen that encrypt the directories of the Websites, therefore allows to propose future works of new types of ransomware by means of simulation tools.

Keywords: Ransomware; Web Server; Linux; Windows.

1 INTRODUCTION

They point out that currently ransomware attacks are becoming a frequent security problem for companies and end users of desktop, mobile, laptop computers, as well as for hospitals, schools, Government or other public and private institutions with information sensitive and confidential. That is, Ransomware is a malware compared to other computer viruses such as Trojan horses, worms and spyware. Regarding Bhardwaj, Avasthi, Sastry, and Subrahmanyam (2016); Luo and Liao (2016); Kansagra, Kumhar, and Jha (2016) mention that cryptography was previously used to protect information.

However, ransomware appears to extort money from the victim by encrypting their valuable information. Brewer (2016); Sittig and Singh (2016) point out that more than four million ransomware attacks occurred in the second quarter of 2015 with the amount of 1.2 million dollars, as well as for the health sector the ransomware threat is greater because it is not enough to send them an email to employees to avoid being attacked. However, Symantec (2016) reports approximately 0.2% of the total attacks at the end of 2014, the figure reached 4%, being double the number of attacks in 2013, therefore 8274 cases of ransomware were registered and

then increasing the figure 45 times out of 373,342 in the period of 2014, in this same year it released crypto ransomware considered much more harmful, therefore it encrypts personal files and saves the keys to decrypt them on an external website.

Likewise, from the analysis of locker vs crypto ransomware, since each month crypto ransomware attacks increase in the last 12 months, 64% were detected based on binary files, while the remaining 36% were detected by locker ransomware (Sharma, Zawar, & Patil, 2016).

Regarding vulnerabilities in Linux servers, Krebs (2015); Cabaj, Gawkowski, Grochowski, and Osojca (2015) expose, based on connection attempts, the way an exploit tries to infiltrate victims' computers, thus as the compromised servers uses the HTTP protocol, of which the files are encrypted by means of the CryptoWall because of the web administrator provides.

Likewise Constantin (2015); Kovalev, Otroshkevich, Sidorov, and Rassokhin (2014) expose the expansion in attacks on web servers, that is, it was discovered by malware researchers by the Doctor Web and Yandex antivirus programs that used a massive infection campaign in the third quarter of 2013. Regarding Shahzad, Shahzad, and Farooq (2013) they state that 114 malware for Linux were recently detected, considered with a 96% accuracy in malicious activities. On the other hand, Bitdefender (2016a) mentions that attacks on web servers are aimed at stealing data; as Websites developed with LAMP technology (Linux, Apache, Mysql, and PHP), Content managers such as Wordpress, Joomla and Drupal for Windows and Linux have the same vulnerability impact with the new ransomware from the CTB loker family in effect McAfee (2015) reports a 165% increase during the first quarter.

Likewise, Linux.esconder1 is a type of ransomware that uses a highly secure encryption algorithm and public key cryptography, that is, this malware encrypts the home page and associated folders and then asks for a ransom Bonderud (2016).

In addition Pauli (2016) indicates, of the SamSam ransomware attacks are directed at the vulnerable JBoss servers of Hospitals. Thus Lawrence (2016) indicates about Fairware ransomware attacks on Linux web servers, encrypting the root folder, based on the Redis database settings.

In effect, you have to pay two bitcoins to get them back. The present work aims to analyze the Ransomware attacks on Web Servers on Linux and Windows-based Operating Systems, referring to the comparative bibliographic review of studies carried out by experts, as well as

various types of ransomware due to frequent attacks directed at Health, Education, Organizations and Governments sectors depending on the criticality of the business for the attackers.

2 RELATED WORK

Pathak (2016); Dubell (2016); Di-Lorio et al. (2015) define Ransomware as a recent variant of scareware, this type of malware aims to extort money from the victim in order to infect and take control of computers with their valuable information. In effect ask for a ransom money to decipher the information. On the other hand, Sgandurra, Muñoz, Mohsen, and Lupu (2016) and Luo and Liao (2007) point out that ransomware blocks or encrypts documents and files to prevent access; using a secret key only known to the malware authors after the publication of the ransom sample through a text file or website, this type of malware forces the victim to pay the required ransom, it can be delivered by a exploit kit to use the vulnerabilities on the infected computer known as Cryptovirology. Thus, Kharraz, Robertson, Balzarotti, Bilge, and Kirda (2014) demonstrate with an analysis of a sample of 1,359 ransomware families of similar characteristics of attacks on computers and files.

Hampton and Baig (2015) state that the first registered ransomware is the PC Cyborgtroyano (AIDS) pioneered in 1989, it was distributed via email, sending thousands of people and companies to later install AUTOEXC.BAT on the victims' computers. That is, the cybercriminal performs a count of the number of times that users restart the computers, using a symmetric key when encrypting and decrypting the data, therefore the key is somewhere in the malware. Later in 1996 Shillam (2012), asymmetric encryption was created since the ransomware authors only knew the decryption key, later this idea was developed for testing attacks against a Macintosh SE/30 by Adam Young and Moti Yung.

As for Salvi and Kerkar (2015), they indicate that in 2006 criminal organizations began with effective asymmetric ASA encryption, Trojans such as file, Gpcode, TROJ.RANSOM.A, Krotten, Archive and Cryzip, to later use encryption schemes RSA, with increasing key sizes. However, Aziz (2016). Mention to have a combination of Symmetric Algorithm like AES and Asymmetric Encryption Algorithm like RSA will result in a new method called FEK (Encryption Key File), this technique works faster for hackers in short, they can encrypt and decrypt large files quantity and size during the infection process.

In relation to the attackers of several families of ransomware

have developed with different programming languages such as JavaScript, PHP, PowerShell or Python, to develop desktop applications for Windows, Linux and Mac OS X with JavaScript therefore, to evade detection is Say the adoption of new techniques shows that they are constantly evolving to maintain their position and remain profitable (Symantec, 2016). Sgandurra et al., (2016), Mention that the first ransomware was created in 2006 with the name Archiveus, which performs RSA-type encryption, below is Table 1 with the ransomware chronology, listed with the year and characteristics types of malware.

3 RANSOMWARE ON WEB SERVER

Crypto Wall was obtained from an infected computer in college, provided by the security community from the user's perspective. Now there are two known ways that you can infect your email computer, spam with malware, attachments, and Websites where you install an Exploit Kit for Drive by-Download attacks. After the vulnerability of Java Runtime Environment (JRE) and Adobe Flash player, The sequence of the compromised proxies, by means of the key generation in the server and the Honey Client server through the network and Internet, in effect the Scan Kit is evolving as the most destructive ransomware on the internet, as it infected more than 600,000 systems between March and August with 5.250 million encrypted files.

CTB-Locker developed in PHP, web-oriented ransomware and for Windows version computers. In the case of a Web Server, this malware replaces the Web site's index.php file and creates a cryto call in the directory, that is, it contains the additional PHP files that encrypts them in the Web directory, when a request designed by a attacker (Scaife, Carter, Traynor, & Butler, 2016).

Linux. Hide is a ransom ware for Linux Operating Systems, a type of attack against Web Servers, currently affecting in recent months. Now there are three versions Linux.Encoder1, Linux. Encoder2 and Linux. Encoder 3 are able to decrypt this information and provide a free Linux. Encoder decryption tool for any infected victim. In addition, the Internet is based on Linux powered Web Servers, sometimes more than one Web Site can be hosted that could be affected (Bidefender, 2015). Later, Herzog and Balmas (2016) mention that they made one of the modifications to the malware that it eventually involved hashing the timestamp 8 times and using the result as an AES key. On the one hand, DR.WED (2016) comments on the Linux.Enconder.3 ransomware, it is encryption for Linux written in C

then using the Polar SSL library, that is, it is an advanced modification of Linux.Enconder.1 and Linux.Enconder2.

4 COMPARATIVE ANALYSIS OF RANSOMWARE

Attacks between Windows and Linux Picking up the most important vulnerabilities in Web Servers, lately the attackers run the Trojan.Ransomcrypt.AE in the back of SamSam Ransomware in Windows to assault the entire community of this malware. On the other hand, the Vulnerabilities in Linux Operating System is Linux. Find that it's miles a version of the CTB-loker whose predominant objective is Web Servers. Thus, attackers encrypt all Websites associated with the server, because of maximum attacks they may be designed for the Windows Operating System (Symantec, 2016).

Table 1 Attacks on web servers

Web server	Description	Ransomware Attack
WINDOWS		
Apache	Web server with Wordpress content manager	CTB-loker
JBoss	Application servers	Sam sam
JRE and Flash	Websites where you install an Exploit Kit	CryptoWall 4.0
LINUX		
Apache	Web server with Wordpress content manager	Linux.enconder 1,2,3
Redis	Open source tool used by web application developers.	FairWare

5 CONCLUSIONS

With the completion of this work, it has been possible to characterize ransomware attacks on Web Servers, based on Linux and Windows Operating Systems, frequently directed at the Health, Education and Government sectors due to the criticality of the business, for cybercriminals it is profitable for the amount of BITCOIN that can raise for the ransom. Also, the ransom in periodic installments to obtain the key to decrypt and retrieve the information from the Web Server

directories and associated web sites. It should be noted that the type of Samsam ransom ware for the Windows operating system is critical since the organization's network through SSH is authenticated by entering the JBoos server. Ultimately, the analysis is intended to inform about the vulnerabilities of web servers in Linux and Windows Operating Systems, due to the reviewed cases of services and tools used by developers for the implementation of Apache, JBoss and Redis database structure servers, through a list of early warning tools against ransomware attacks. Also with a list of comparative analysis of ransomware attacks between Windows and Linux, since it encrypts the files and directories, belonging to the Servers and Websites. The limitations of this work, as it is a review analysis, a structured investigation has not been carried out to simulate ransomware attacks, using tools to prevent attacks or early warning. In addition, there are no publications of academic or scientific journals as it is a new ransomware topic on Web Servers based on Linux and Windows Operating Systems. However, it was possible to perform an analysis of types of ransomware, CTB loker, Sam Sam, Crypto Wall 4.0, Linux. Enconder and Fair Ware, targeting Web Servers. Bearing in mind, as future work it is recommended to carry out scientific research on new types of attacks from the ransomware family. Also, a simulation with the tools for the future prevention and early warning of ransomware attacks on web servers.

REFERENCE

1. Cisco, "Cisco," [Online]. Available: https://www.cisco.com/c/en/us/ about/security center/ virus-differences.html # adware. [Last access: April 20, 2018].
2. Kaspersky Lab, "Kaspersky Lab," [Online]. Available: https://usa.kaspersky.com/ resource center/threats/ransomware. [Last access: April 20, 2018].
3. M. TO. Mendoza, "We live security," Eset, [Online].https:// www.welivesecurity.com/la es/2018/03/01/impacto ransomwarelatinoamerica- 2017 /. [Last access: July 3, 2018]. 4. McAfee Labs, "2016 Threats Predictions," McAfee Labs, 2015.
4. Kaspersky Lab, "STORY OF THE YEAR 2017," Kaspersky Lab, 2017.
5. R. Unuchek, "Mobile malware evolution 2017," Kaspersky Lab, 2018.
6. Eset, "Eset," [Online]. Available: https://support.eset.com/kb2563/ locale = en_US & viewlocale = es_ES.
7. Stern, "Kaspersky Lab," [Online]. Available: https://www.kaspersky.es/blog/10-symptoms-of a-malicious-infection /1348/.

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ANALYSIS ON MULTISTORY STRUCTURAL SYSTEM WITH VARING OUTRIGGER BELT TRUSS: A CASE

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Abstract- The development of high-rise buildings in the modern era has been fueled by advances in engineering and technology, the development of high-strength structural materials, the rise in population, and a scarcity of land due to rising land prices and rapid urbanization. Due to wind and seismic forces, high-rise buildings are the most vulnerable to lateral loadings. The trend toward taller and slender structures necessitates the development of a structural system that can effectively resist lateral loads at a low cost. For the dynamic analysis of flat slab multistory buildings, we compared two lateral load resisting systems. One system is outrigger bracing. In high-rise buildings, the outrigger bracing system provides a solution for controlling excessive drift and displacement.
Keywords: Dynamic Analysis, Flat-slab.

1 INTRODUCTION

Various studies have discovered that when used alone, the shear wall provides effective resistance only up to a certain height, after which it becomes uneconomical when compared to the benefit it provides. As a result, a more efficient structural system that provides more stiffness and strength to high-rise structures against wind and seismic loadings while also meeting economic criteria is required. The outrigger bracing system provides more stiffness to tall buildings against lateral displacement and drifts without incurring additional steel costs, proving to be a very cost-effective drift control solution.

The outrigger system is made up of outrigger bracings or outrigger trusses that connect the building's core with the columns on the periphery, and the peripheral columns are connected by belt trusses.

2 CONTRIBUTION OF RESEARCHERS IN FIELD OF FLAT SLAB & LATERAL LOAD RESISTING SYSTEM.

Taranath (1975) [1] investigated the optimum location of the belt-truss along the height that reduced lateral sway under wind loadings

and discovered that the building's midpoint was the best location for a single outrigger. He also proposed a very simple outrigger structural system analysis method.

McNabb (1975) [2] took Taranath's study a step further, employing two outriggers to determine the reduction in lateral drift and confirming Taranath's findings. He suggested that the best outrigger location for drift and displacement control is nearly 0.445 times the structure's height from the top.

Chan and Kuang (1988) [3] pioneered the use of stiff beams at arbitrary locations in the structure to stiffen the structure. According to them, the location of stiff beams has an impact on the performance of high-rise structures when subjected to lateral loads.

To investigate the suitability of outriggers, Qi and Chen (1996) [4] used two-dimensional models. Their model consisted of a channel core and two columns connected to the core by a series of outrigger beams. Three outriggers were found to significantly reduce lateral displacement.

Using the diagonal outrigger and belt truss system, Po Seng Kiran and Frits Torang Siahaan (2001) [5] worked on increasing the stiffness of the structure to make it capable of resisting lateral loads such as wind and seismic loads. For the analysis, the researchers used eight two-dimensional models of 40 storey height and five three-dimensional models of 60 storey height with various outrigger configurations. According to British standards, two-dimensional models are analysed for wind loads and three-dimensional models are analysed for seismic loads. For a comparative study of roof displacement, different locations as well as the height of outriggers are taken into account. In the case of two-dimensional models, the researchers discovered that a single outrigger placed in the middle height of the structure reduces lateral displacement by around 56 percent, while two outriggers, one at the top and the other in the middle height of the structure, reduces lateral displacement by around 65 percent.

Hoenderkamp and Baker (2003) [6] presented a graphical method for the preliminary design of an outrigger-braced structure with truss core and shear wall based on five non-dimensional parameters. The flexible foundation effect is taken into account, and the central core is a shear wall with a uniform wind load distribution. By analysing benchmark examples, it was discovered that the more precise the models, the more the optimum location changes. The best spots were found to be at 0.3 and 0.4 of the structure heights, respectively.

The method developed by Zeidabadi et al. (2004) [7] is based on the continuum method. The

method is used to investigate the structural behaviour of coupled shear walls with internal beams and outriggers.

K.K. Sangle et al. (2012**)** [8] By incorporating various types of bracings, the performance of steel framed structures under seismic loadings was investigated. This study used data from the Northridge earthquake to perform time history analysis. This study looked at six different configurations, including the G+40 bare frame model (without bracing) and G+40 models with various bracing patterns, including diagonal bracing, X-bracing, K-bracing, and knee bracing.

Junais Ahmed AK and Yamini Sreevalli (2014) [9] used outriggers placed at different locations of structural models to investigate the change in fundamental time period of the building. Structural models of 30, 40, 50, and 60 storeys are created in FEM-based ETABS software for this purpose. For earthquake loads, the lateral loads are applied according to IS 1893(PART 1) – 2002, and for wind loads, according to IS 875(PART 3) – 1987.

M.R. Suresh and Shruti Badami (2014) [10] investigated the best structural configuration for structures of various heights that are subjected to gravity and wind loads. "Rigid Frame," "Shear Wall/Central Core," "Wall-Frame Interaction," and "Outrigger" systems were all considered by the researchers. The goal of this research was to determine the best structural system for a building of a certain height. They looked at models with symmetrical plans of G+15, G+30, G+45, and G+60 storeys. They discovered that Rigid Frame with Shear Wall system is suitable for buildings up to 40 storeys in height, but outrigger structural system is very much needed for buildings over 40 storeys in height.

Abdul Karim Mulla and Shrinivas B.N (2015) [11] considered both regular and vertically irregular structures in their research. The researchers used 20-story building models with vertical irregularity but symmetrical plan for this study. According to IS codes, they used the linear static method and the response spectrum method. They also looked at the behaviour of structural models in various seismic zones, both for concrete and steel outriggers.

H.S. Sukesh et al. (2017) [12] investigated outrigger systems in a 35-story building model with varying relative stiffness at various locations. They used outriggers at 0.25H, 0.5H, 0.75H, and H levels along the building's height(H) and varied the relative stiffness of outrigger beams at all of these locations by changing dimensions. Outrigger beam dimensions for various cases were 300x600mm, 300x1200mm, 300x 1800mm, 300x2400mm, and 300x3000mm.

The comparative study employs six different models. Model 1 was a bare-frame design with no shear walls or outriggers.

The performance of structures with steel outriggers and concrete beam outriggers was studied by Prajyot A. Kakde and Ravindra Desai (2017) [13]. They considered a tall building with a central core and plan dimensions of 30m x 30m and a height of 70 stories. In ETABS 2016, wind load is taken into account when analysing models based on displacement, drift, and base shear. Steel outriggers were found to be more effective at controlling lateral displacement and storey drift than aluminium outriggers. Steel outriggers also have lower base shear than concrete outriggers. The outrigger system, in combination with a structural steel peripheral belt, is more effective than concrete deep beams.

The optimal number of outriggers for reducing top storey displacement was determined by Sajjad Baygi and Amin Khazaee (2019) [14]. The structural model's base moment in the core and top displacement under lateral loadings were calculated using the MATLAB programme. According to them, the optimal number of outriggers in a structure is determined by a variety of factors including the axial rigidity of columns, bay length, structure height, and, most importantly, the stiffness of outriggers provided. When one of these factors changes, the optimal number of outriggers changes as well. They also discovered that using four or more outriggers in a structure does not reduce lateral displacement beyond a certain point, but rather leads to increased lateral displacement.

3 SUMMARY OF LITERATURE REVIEW AND RESEARCH GAPS

i. Understanding the structure's nonlinear behaviour is insufficient. There is a lot of research going on in nonlinear static analysis, or push over-analysis, and there is also a lot of focus on the direction of nonlinear dynamic analysis.

ii. To understand the Flat slab's entire behaviour from the linear stage to the collapse stage, a nonlinear dynamic analysis study is conducted on a multistory structure with various lateral load resisting systems. Complex-shaped buildings are becoming more popular these days, but they run the risk of being damaged during earthquakes. As a result, such structures should be properly designed to account for their dynamic behaviour.

iii. According to the literature review, some research has been done on the analysis of multi-story buildings with flat slabs and the comparison of two lateral load resisting

systems under seismic loading conditions.

iv. It was noted in the Literature Survey that very little work had been done in the analysis of the same topic. Because no author has compared the outcomes of similar cases. As a result, after summarising the literature review, these cases are selected and must be studied in accordance with the Indian Code of Practice.

4 CONCLUSION

Since various papers have been examined and what the authors have discovered in the process, but they are not comparable. Only by comparing various building cases of multi-story buildings can the best result parameters be determined. To find the result parameters, a total of four building cases are prepared, with one optimum case of a flat slab. The load is then classified as dead load, live load, earthquake load, and various load combinations are considered according to IS 1893-2002. The results obtained because of the various cases analysed will be compared, and the appropriate case with the lowest value will be the work's conclusion.

REFERENCES

1. Kaulkhere R.V, Prof. G.N Shete, (2017) “Analysis and Design of Flat Slab with Various Shapes”, *International Journal of Scientific Development and Research*, Vol. 2, pp. 538-544, Issue No.5, May 2017.
2. Mohammed Imran, M. Visweswara Rao, Dr. Jammi Ashok, (2017) “A Comparative Study of Flat Slab Vs Post Tensioned Flat Slab”, *International Journal for Scientific Research & Development,* Vol. 5, pp. 979-982, Issue No.9, 2017.
3. Salunkhe, U., and Kanase, J.S., (2017). “Seismic Demand of Framed Structure with Mass Irregularity International Journal of Science.” *Engineering and Technology Research* (IJSETR) 6(1)
4. Sayyed O., Kushwah S.S., Rawat A., (2017). “Effect of Infill and Mass Irregularity on RC Building under Seismic Loading.” *International Research Journal of Engineering and Technology* (IRJET) 04 (2)
5. Renuka Ramteke, (2017) "Parametric study of multistoried R.C.C. flat slab structure under seismic effect having different plan aspect ratio and slenderness ratio” *International Journal of Trend in Scientific Research and Development,* Vol. 1(4), pp. 210-220.
6. Prabesh Sharma., D.R Rajendra. S, Vanisree C.N. (2016). “Scrutinizing the Structural Response of Regular and Irregular Structure (With and Without Shear Wall) Subjected to Seismic and Wind Loading.” *International Journal on Recent and Innovation Trends in Computing and Communication*, 4(3), 353 – 359.
7. Maikesh Chouhan., Ravi Kumar Makode (2016). “Dynamic Analysis of Multi-Storeyed Frame-Shear Wall Building Considering SSI.” *Int. Journal of Engineering Research and Application*, 6(8) part-I, 31-35.
8. Navjot Kaur Bhatia., Tushar Golait, (2016). “Studying the Response of Flat Slabs & Grid

Slabs Systems in Conventional RCC Buildings." *International Journal of Trend in Research and Development*,3(3), 334-337.

9. M. K. Devtale, S. S. Sayyed, Y. U. Kaulkarni, P. G. Chandak,(2016) "Comparison of Seismic Response Between Flat Slab Building and Regular Frame Building", *International Journal of Advancement in Engineering Technology, Management & Applied Science*, Vol. 3, pp. 104-111, Issue No.6, June 2016.
10. Khan, P. I., and Dhamge, N.R., (2016). "Seismic analysis of multistoried rcc building due to mass irregularity." *IJEDR* 4(3)
11. Mohd Atif., Prof. Laxmikant Vairagade., Vikrant Nair., (2015). "Comparative Study on Seismic Analysis of Multi-storey Building Stiffened with Bracing and Shear Wall." *International Research Journal of Engineering and Technology* (IRJET), 2(5), 1158-1170.
12. P. Srinivasulu, A. Dattatreya Kumar, "Behavior of RCC Flat Slab Structures Under Earthquake Loading," *International Journal of Engineering & Science Research*, Vol.5, pp.821-829, Issue No.7, July 2015.
13. Akil Ahmed (2015). "Dynamic Analysis of Multi-storey RCC Building Frames." *International Conference on Inter Disciplinary Research in Engineering and Technology, 89-94.*
14. R. S. More, V. S. Sawant, "Analysis of Flat Slab. (2015) *International Journal of Science and Research*, Vol. 4, pp. 98-101, Issue 07, July 2015.
15. Mr.K.LovaRaju., Dr.K.V.G.D.Balaji., (2015). "Effective location of shear wall on performance of building frame subjected to earthquake load." *International Advanced Research Journal in Science, Engineering and Technology*. 2(1), 33-36
16. G.V. Sai Himaja., Ashwini.L.K., N. Jayaramappa., (2015). "Comparative Study on Non-Linear Analysis of Infilled Frames for Vertically Irregular Buildings." *International Journal of Engineering Science Invention*. 4(6) 42-51.
17. N. Janardhana Reddy., D. Gose Peera., T. Anil Kumar Reddy (2015) "Seismic Analysis of Multi-Storied Building with Shear Walls Using ETABS-2013" International Journal of Science and Research (IJSR) ,4(11), 1030-1040.
18. Ali Koçak, Başak Zengin, Fethi Kadioğlu (2014) "Performance Assessment Of Irregular Rc Buildings With Shear Walls After Earthquake" *http://dx.doi.org/10.1016/j.engfailanal.2015.05.016*
19. Anuja Walvekar, H.S.Jadhav (2015) "Parametric Study Of Flat Slab Building With And Without Shear Wall To Seismic Performance" *International Journal of Research in Engineering and Technology*. 4(4),601-607.
20. Ravindra B N, Mallikarjun S. Bhandiwad (2015) "Dynamic Analysis of Soft Storey Building with Flat Slab" *International Research Journal of Engineering and Technology* (IRJET), 2(4), 1644-1648.
21. Bhruguli H. Gandhi "Effect of Opening on Behaviour Of Shear Wall" *International Journal for Technological Research In Engineering*, 4(3) 875-878.
22. Reddy A., Fernandez R.J., (2015). "Seismic analysis of RC regular and irregular frame structures." *International Research Journal of Engineering and Technology* (IRJET), 02(5)
23. Mukundan H., and Manivel S., (2015). "Effect of Vertical Stiffness

Irregularity on Multi- Storey Shear Wall-framed Structures using Response Spectrum Analysis", *International Journal of Innovative Research in Science, Engineering and Technology*, 4(3)

24. Sagar, Patil B., Prof. Katti Gururaj B., (2015) "Study of Behaviour of Plan & Vertical Irregularity by Seismic Analysis." *International Journal for Scientific Research & Development (IJSRD)*, 03(4)
25. Vishal A. Itware., Dr. Uttam B. Kalwane (2015) "Effects of Openings in Shear Wall on Seismic Response of Structure" *Int. Journal of Engineering Research and Applications* 5(7) 41-45.
26. Ravikanth Chittiprolu, Ramancharla Pradeep Kumar., (2015) "Significance of Shear Wall in High-rise Irregular Buildings" *International Journal of Education and applied research* 4(2) 35-37.
27. Navyashree K, Sahana T.S (2014). "Use of Flat Slabs in Multi-Storey Commercial Building Situated in High Seismic Zone" *International Journal of Research in Engineering and Technology*. 3(8) 439-451.
28. Sumit Pawah., Vivek Tiwari., Madhavi Prajapati. (2014) "Analytical approach to study effect of shear wall on flat slab & two-way slab" *International Journal of Emerging Technology and Advanced Engineering.*,4(7) 244-252.
29. Amit A. Sathawane., R.S. Deotale., (2014) "Analysis and Design of Flat Slab And Grid Slab And Their Cost Comparison." *International Journal of Engineering Research and Applications*, 1(3) 837-848.
30. Lakshmi K.O., Prof. Jayasree Ramanujan., Mrs. Bindu Sunil., Dr. Laju Kottallil., Prof. Mercy Joseph Poweth. (2014) "Effect of shear wall location in buildings subjected to seismic loads" *Journal of Engineering and Computer science*." 1(1), 7-17.
31. Sejal Bhagat (2014). "Optimization of A Multi-Storey-Building by Optimum Positioning of Shear Wall" *International Journal of Research in Engineering and Technology*, 3(1), 56-74
32. Konakalla R., Dutt R., Dr. Raparla H., (2014) "Response Study of Multi-Storied Buildings with Plan Irregularity Subjected to Earthquake and Wind Loads Using Linear Static Analysis." Journal of Mechanical and Civil Engineering (IOSR-JMCE) 12-19
33. Bansal H., Gagandeep, (2014). "Seismic Analysis and Design of Vertically Irregular RC Building Frames." *International Journal of Science and Research (IJSR)*, 3 (8), 207-215
34. Soundarya R., Reddy K.G., Harshitha, Prathima, and Guruprasad, (2014). "Seismic Analysis of Symmetric RC Frame Using Response Spectrum Method and Time History Method." International Journal of Scientific Research and Education, 2(3), 483-499
35. Konakalla R., (2014). "Effect of Vertical Irregularity in Multi-Storied Buildings under Dynamic Loads Using Linear Static Analysis." IJEAR 4(2), 29-34
36. Satpute S G., and D B Kulkarni (2013). "Comparative Study of Reinforced Concrete Shear Wall Analysis in Multi-storeyed Building with Openings by Nonlinear Methods." *Int. J. Struct. & Civil Engg. Res.* 2013 2(3) 183-189.
37. Miguel Fernandez Ruiz, Yaser Mirzai and Aurello Muttoni,(2013) "Post Punching Behaviour of Flat Slab", *ACI Structural Journal*, Vol.110, pp.801-812, September 2013.6

38. Patil, A.S., and Kumbhar, P. D., (2013). "Time History Analysis of Multistoried RCC Buildings for Different Seismic Intensities." *Int. J. Struct. & Civil Engg. Res.*, 2(3)
39. Aijaj, S.A. and Rahman A., (2013). "Seismic Response of Vertically Irregular RC Frame with Stiffness Irregularity at Fourth Floor." *International Journal of Emerging Technology and Advanced Engineering*, 3(8), 377-385.
40. Varadharajan S., Sehgal V. K., and Saini B., (2012). "Review of different Structural irregularities in buildings." *Journal of Structural Engineering* (ISR), 39(5), 393-418.
41. Christidis Konstantinos, Vougioukas Emmanouil and Trezos .G Konstantinos (2013) "Seismic assessment of RC shear walls non complaint with current code provision" *Magazine of Concrete Research, Vol. 65, No. 17, 1059 – 1072*
42. Rajesh Jayarambhai Prajapati &Vinubhai. R. Patel (2013) "Effect of Different Position of Shear Wall on Deflection In High Rise Building" *International Journal of Advances in Engineering & Technology, Sept. 2013.*
43. Jaime Landingin., Hugo Rodrigues, Humberto Varum, António Arêde4, Anibal Costa (2012) "Comparative Analysis of Rc Irregular Buildings Designed According to Different Seismic Design Codes" *15th International Conference on Experimental Mechanics*. PAPER REF: 2955
44. Sharman Reza Chowdhury., M.A. Rahman, M.J.Islam., A.K.Das (2012) "Effects of Openings in Shear Wall on Seismic Response of Structures" *International Journal of Computer Applications*, (0975 – 8887), 59(1), 10-13.
45. Amit A. Sathawane, R. S. Deotale, "Analysis and Design of Flat Slab and Grid Slab and Their Cost Comparison", *International Journal of Engineering Research and Applications*, Vol.1, pp. 122-126, Issue No.2, Dec 2012.1
46. Dr. Uttamasha Gupta, Shruti Ratnaparkhe, Padma Gome, "Seismic Behaviour of Buildings Having Flat Slabs with Drops", *International Journal of Emerging Technology and Advanced Engineering*, Vol.2, pp. 416-421, Issue No.10, October 2012.2
47. S.Varadharajan., V.K. Sehgal.,and B.Saini, "Review of different Structural irregularities in buildings" Journal of Structural Engineering ,Vol. 39(5), pp. 39-51, 2011.
48. Dr. S.K. Dubey., P.D. Sangamnerkar. (2011) Seismic Behaviour of Asymmetric Rc Buildings" *International Journal of Advanced Engineering Technology* 2(4),226-301
49. Soni P. Divesh, (2006). "Qualitative Review of Seismic Response of Vertically Irregular Building Frames." *ISET Journal of Earthquake Technology, Technical* Note, Vol. 43(4).
50. Poncet, L., And Tremblay, R., (2004). "Influence of Mass Irregularity on The Seismic Design and Performance of Multi-Storey Braced Steel Frames." *13th World Conference on Earthquake Engineering Vancouver, B.C., Canada* Paper No. 2896

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A REVIEW AND CONCEPTUAL STUDY ON GEOPOLYMER CONCRETE

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Abstract – Concrete is an important building material that is used in a variety of applications, including infrastructure and industry. This is partly because concrete is made from natural materials found all over the world, and it is a versatile material that allows for architectural freedom. According to Bjorn Lomborg (2001), concrete is used more than any other man-made material on the planet. Every year, more than a tonne of concrete is produced for every human on the planet, making concrete the world's second most consumed substance after water [Sara Hart, 2008].
Keywords: Geopolymer concreter, RHA.

1 INTRODUCTION

Geopolymer concrete is a novel construction material that is made from inorganic molecules reacting chemically. Fly Ash, a by-product of coal used in thermal power plants, is widely available around the world. Fly ash is high in silica, and when alumina reacts with an alkaline solution, an aluminosilicate gel forms, which serves as the concrete's binding material. It's a great alternative to the existing plain cement concrete in construction. Geopolymer concrete must be made without the use of any cement.

Pavements, retaining walls, water tanks, and precast bridge decks have all been built with this concrete. Geopolymer concrete has been used in a variety of applications, including earth-retaining and water-containment structures.

2 CONTRIBUTION OF RESEARCHERS IN FIELD OF GEOPOLYMER CONCRETE

Hemn Qader Ahmed et. al (2019) present research to determine the flexural quality and behaviour of geopolymer concrete and standard Portland solid beams reinforced with carbon fiber-strengthened polymer beams. As a result, consider Twelve pillars were thrown and explored using the four-point bowing test over a successful range of 2000 mm, consisting of nine geopolymer concrete and three normal Portland solid beams. Furthermore, consider the outcome based on the following parameters, such as The factors fortification proportion, compressive quality, and solid sorts were also considered. The first splitting burden, the extreme burden, the load-diversion conduct, the load-strain

bend, the break width, and the number of breaks are all factors to consider.?

S. Mesgari et al (2019) discussed geopolymer concrete reusing, i.e. using reused geopolymer totals as coarse totals for new geopolymer concrete The executive's strategy for geopolymer concrete is squandered by the paper's features. Geopolymer totals are used in the production of Portland concrete solid, which is widely used in many countries. The properties of Portland concrete cement and geopolymer concrete made with different substances obviously geopolymer reused totals (0 percent, 20%, half, and 100% coarse normal totals substitution) are researched and compared to those of Portland concrete cement containing reused Portland concrete solid totals.

Aly Muhammed Aly et. al (2019) The purpose of this study was to examine the effect of different percentages of crumb rubber as a partial substitution of both fine and coarse aggregates by volume proportion (0, 10, 20, and 30%) on the hardened properties (compressive, tensile, and flexural strength) and impact resistance of dross-primarily based geopolymer concrete (replacing the cement with ground coarse furnace dross (GGBFS) a Finally, the work provides a combination of high compressive strength, malleability, and impact resistance that can be used in structural parts subjected to impact and dynamic load, such as bridges (bridge approach slabs, railway buffers, and airfield runways).

Amer Hassan et. al (2019) In this review paper, the mixture design, mechanical properties, durability, and microstructure of GPC were discussed to determine and file the most recent statistics and information about geopolymer concrete. Furthermore, the microstructure of GPC and OPC concrete had been investigated to understand the internal shape of GPC and examine its engineering properties such as electricity and sturdiness, among others..

Amer Hassan et al (2019) This paper conducts a review of the mechanical performance of reinforced geopolymer concrete structural elements and summarises the findings on the mechanical performance of reinforced GPC elements columns, beams, and walls. The mechanical properties of GPC structural elements were investigated and compared with those of OPC concrete in this review study. The failure mode of a GPC structural element has also been reported, and it was almost identical to the failure mode of an OPC concrete. The potential of GPC in terms of chemical resistance and heat resistance could be used extensively in a variety of industrial constructions such as marine structures, pavements, and sewage pylons.

Sanghamitra Jena & Ramakanta Planography (2019) The goal of this research is to create fly ash geopolymer concrete with

ferrochrome slag as coarse aggregate. The experimental results of all properties of ferrochrome slag-based geopolymer concrete are compared to controlled geopolymer concrete, and it is proven to be the most efficient, technically acceptable, and environmentally compatible construction material.

Bharat Bhushan Jindal (2019) The review paper summarises the impact of various mineral additives on the mechanical, durability, and microstructure properties of geopolymer mortar and concrete. According to the research findings, geopolymer products blended with these materials demonstrated a significant improvement in mechanical and durability properties under normal temperature conditions.

Sun Keke et al (2019) Based on the paste thickness of coated aggregate and the close packing theory, a method for the mix proportion of geopolymer concrete was proposed in this paper. The water-to-metakaolin ratio was chosen using the minimum water requirement method in this method. The close packing theory was used to design the aggregate gradation, and the amount of metakaolin was determined by the paste thickness of coated aggregate.

Inamullah Khan an et al (2019) Experiments were conducted in this paper to measure early-age shrinkage and tensile creep of geopolymer concrete and assess their influence on early-age cracking in reinforced concrete members. Two geopolymer concrete mixes were tested. The specimens for the first mix were heat cured at either 60' C or 90' C.

Amin Noushini et al (2019) This study evaluated the chloride diffusion resistance of low-calcium fly ash-based geopolymer concrete through electrical and bulk diffusion techniques. The geopolymer concretes were prepared using 12 different heat curing conditions: three temperatures of 60, 75 and 90 °C and four curing durations of 8, 12, 18 and 24 h, as well as ambient curing. The mechanical and transport properties and microstructural characteristics of the geopolymer concretes were examined.

Oriyomi M. Okeyinka et al (2019) This study investigated an alternative base material for geopolymer concrete. The physical and chemical properties of brewery sludge residue ash (BSA) were studied to determine its suitability as a base material for geopolymer binder. Brewery sludge residue ash-based geopolymer concrete (BSAGC) specimens were created by activating BSA with alkaline liquids (NaOH and Na2SiO2). The compressive strength of the BSAGC specimens was measured to assess the strength development and, as a result, the effectiveness of the polymerization reaction that occurred.

Haiqiu Zhang & Muhammad N.S. Hadi (2019) An experimental investigation of a new type of composite piles geogrid-confined

pervious geopolymer concrete piles (GPGCPs) with a fibre reinforced polymer (FRP)-polyvinyl chloride (PVC)-confined concrete core is presented in this study (FPCC).

Joseph Davidovits (2015) At Penn State Materials Research Laboratory, Penn State University, USA, research on the environmental impact (LCA) with respect to Global Warming Potential (GWP) related to CO2 emission comparison between Portland cement manufacture and geopolymer cement began as early as 1990. Unfortunately, American agencies (DOE and EPA) stated that this was not a pressing issue, and both declined to fund research proposals.

Joseph Davidovits (2014) Seventeen samples of (co-)combustion European fly ashes were tested for geopolymer cement suitability. The ashes were mixed with the various required chemical components used in (Ca,K)-poly(sialate-siloxo) cement and cured at room temperature (60-80 percent by weight of the mix).

K. Srinivasan and A. Sivakumar (2013) The purpose of this research is to provide a comprehensive review of the various manufacturing processes involved in the development of a geopolymer binder. More recent studies have revealed a significant push for wider applications of geopolymer binder towards a cost-effective construction practise. This also includes reducing global warming caused by carbon dioxide emissions from cement plants.

B. Damodhara Reddy et.al. (2013) In this paper a critical review of the influence of RHA on various properties of mortar cubes made of partial replacement of cement by rice husk ash admixture with 5%, 10% and 15% of total powder content by weight both with and without the presence of Super plasticizer.

B. Damodhara Reddy et al (2013) A critical review of the influence of rice husk ash (RHA) on various properties of mortar cubes is made in this paper. Partial replacement of cement by rice husk ash admixture with 5%, 10%, and 15% of total powder content by weight with and without the presence of Superplasticizer is made. Cube strength with Ordinary Portland Cement (OPC) and Portland Slag Cement (PSC) (PSC) The results of curing tests after 3,7,28,90, and 365 days, as well as durability tests after 60 days, were analysed to determine the effect of additional content and curing time on compressive strength.

Bouziani Tayeb et al (2013). This paper studies the effect of marble powder content (MP) on the properties of the sand concrete (SCSC) at fresh and hardened states. The properties of the freshly prepared mixes tested are the mini-slump flow, the V-funnel flow time and viscosity. At the hardened state, the parameter which has been determined is the 28-day compressive strength.

D. A. Opeyemi & O. O. Makinde (2012) In this paper the

replacement varied from 5% to 20% in a mix of 1:2:4. Cubes cast comprise the control and specimen samples with various test considered and the results showed that workability were consistent within the described values for lightweight concrete. The compressive strength dropped with the mixed ash content the value was found to be within the range acceptable for concrete particularly light weight concrete. Substitution of the mixture should not be more than 10% for the best result in the concrete production for concrete structures.

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M. I. Abdul Aleem et. al (2012) This paper briefly reviews the constituents of geopolymer concrete its strength and potential applications. Geopolymer concrete is an innovative construction material which shall be produced by the chemical action of inorganic molecules. Fly Ashis a by- product of coal obtained from the thermal power plant is plenty available worldwide. Fly ash is rich in silica and alumina reacted with alkaline solution produced aluminosilicate gel that acted as the binding material for the concrete. It is an excellent alternative construction material to the existing plain cement concrete. Geopolymer concrete shall be produced without using any amount of ordinary Portland cement.

Bouziani Tayeb et. al. (2011) The paper studies the effect of marble powder content (MP) on the properties of the Self Compacting sand concrete (SCSC) at fresh and hardened states. The properties of the fresh prepared mixes tested are the mini-slump flow, the V-funnel flow time and viscosity. At the hardened state, the parameter which has been determined is the 28-day compressive strength. The obtained test results show that the increase of MP content in SCSC, from 150 kg/m3 to 350 kg/m3 It improves the properties at fresh state by decreasing v-funnel flow time (from 5s to1.5s) and increasing the mini-cone slump (from 28cm to 34cm).

Steenie E Wallah(2010) This paper presents the study of creep behaviour of fly ash-based geopolymer concrete. Four series of specimens with various compressive strengths were prepared to study its creep behaviour for the duration of test up to one year. The test method followed the procedures applied for Ordinary Portland Cement (OPC) concrete. Test results show that fly ash-based geopolymer concrete undergoes low creep which is generally less than that of OPC

concrete. After one year of loading, the results for specific creep of fly ash-based geopolymer concrete in this study ranges from 15 to 29 macrostrains for concrete compressive strength 67–40 MPa respectively.

Ghassan Abood Habeeb & Hilmi Bin Mahmud (2010) This paper investigates the properties of rice husk ash (RHA) produced by using a ferro-cement furnace. The effect of grinding on the particle size and the surface area was first investigated, then the XRD analysis was conducted to verify the presence of amorphous silica in the ash. Furthermore, the effect of RHA average particle size and percentage on concrete workability, fresh density, superplasticizer (SP) content and the compressive strength were also investigated.

M.U Dabai et.al. (2009) performed the Compressive strength tests on six mortar cubes with cement replaced by rice husk ash (RHA) at five levels (0, 10, 20, 30, 40 and 50%). After the curing age of 3, 7, 14 and 28 days. The compressive strengths of the cubes at 10% replacement were 12.60, 14.20, 22.10, 28.50 and 36.30 N/mm2 respectively and increased with age of curing but decreased with increase in RHA content for all mixes. The chemical analysis of the rice husk ash revealed high amount of silica (68.12%), alumina (1.01%) and oxides such as calcium oxide (1.01%) and iron oxide (0.78%) responsible for strength, soundness and setting of the concrete.

J.S.J. van Deventer et al (2007) studied about the processes of 'geo-polymerisation'. Conceptual model for depolymerisation is presented in this study, allowing elucidation of the individual mechanistic steps involved in this complex and rapid process. The model is based on the reactions known to occur in the weathering of aluminosilicate minerals under alkaline conditions, which occur in a highly accelerated manner under the conditions required for geopolymerisation.

Divya Khale & Rubina Chaudhary (2007) This review presents the work carried out on the chemical reaction, the source materials, and the factor affecting geo-polymerization. Literature demonstrates that certain mix compositions and reaction conditions such as Al2O3/SiO2, alkali concentration, curing temperature with curing time, water/solid ratio and pH significantly influences the formation and properties of a geopolymer.

3 GAP IN RESEARCH REVIEW AND OBJECTIVE OF NEW RESEARCH

Based on the survey of available literature following gaps in the research are identifying.

- All papers presented a summary of the extensive studies carried out by the authors on the Rice Husk Ash based geopolymer concrete.

Rice Husk Ash is used as the replacement material of the Portland cement to make concrete.

- Rice Husk Ash based geopolymer concrete has good compressive strength by replacement of Cement by Rice Husk Ash upto certain percentages and is suitable for structural applications.
- The papers have identified several economic benefits of using Rice Husk Ash based geopolymer concrete. In the present study an attempt has been made to fully replace the cement by Rice Husk Ash.

4 CONCLUSION

- This study will have a positive impact on the environment as it will reduce the volume of Rice Husk Ash to be disposed of by incineration and land filling.
- It has been seen that strength of geopolymer concrete is achieved within 7 days of casting. For better workability, the ratio of alkaline solution to source material is kept 0.8.
- The early-age strength gain is a characteristic that can best be exploited in the precast industry where steam curing or heated bed curing is common practice and is used to maximize the rate of production elements.

REFERENCES

1. Valeria Corinaldesi, Giacomo Moriconi, and Tarun R. Naik (2005) "Characterization of Marble Powder for its Use in Mortar and Concrete " CANMET/ACI Three-Day International Symposium on Sustainable Development of Cement and Concrete, October 5-7, 2005, Toronto, CANADA"
2. M.U Dabai, C. Muhammad, B.U. Bagudo and A. Musa (2009) "Studies on the Effect of Rice Husk Ash as Cement Admixture" Nigerian Journal of Basic and Applied Science (2009), 17(2)252-256
3. P.Chandan kumar, P.Malleswara Rao, Indubhushan Patnaikuni (2011) "Replacement of Cement with Rice Husk ash in Concrete" Advance materials research Vol. 295- 297 (2011)
4. Bouziani Tayeb*1,2, Benmounah Abdelbaki1, Bederina Madani2 and Lamara Mohamed (2011) "Effect of Marble Powder on the Properties of Self-Compacting Sand Concrete" The Open Construction and Building Technology Journal, 2011, 5, 25-29
5. Hamid Bohlooli, Ali Nazari, Gholamreza Khalaj , Mohammad Mehdi Kaykha, Shadi Riahi (2011) "Experimental investigations and fuzzy logic modeling of compressive strength of geopolymers with seeded fly ash and rice husk bark ash"
6. D. A. Opeyemi, O. O. Makinde (2012) "The Suitability of Partial Replacement of Cement with rice Husk ash and Bone Powder in Concrete Structure" ISSN 2250-2459, Volume 2, Issue 9, September 2012
7. B. Damohara reddy, S. Aruna Jyothy & I. V. Ramana Reddy (2013) "Effect of Rice Husk ash on the properties of Ordinary Portland Cement and Portland Slag Cement With and Without Superplasticizer" ISSN 2249-6866 Vol. 3, Issue 2, Jun 2013, 1-8
8. NPCS (Niir Project Consultancy Service) for the data of RHA (2012-2013)
9. Valeria Corinaldesi, Giacomo Moriconi, and Tarun R. Naik (2005) "Characterization of Marble Powder for its Use in Mortar and Concrete "

CANMET/ACI Three-Day International Symposium on Sustainable Development of Cement and Concrete, October 5-7, 2005, Toronto, CANADA"

10. M.U Dabai, C. Muhammad, B.U. Bagudo and A. Musa (2009) "Studies on the Effect of Rice Husk Ash as Cement Admixture" Nigerian Journal of Basic and Applied Science (2009), 17(2)252-256
11. P.Chandan kumar, P.Malleswara Rao, Indubhushan Patnaikuni (2011) "Replacement of Cement with Rice Husk ash in Concrete" Advance materials research Vol. 295- 297 (2011)
12. Bouziani Tayeb*1,2, Benmounah Abdelbaki1, Bederina Madani2 and Lamara Mohamed (2011) "Effect of Marble Powder on the Properties of Self-Compacting Sand Concrete" The Open Construction and Building Technology Journal, 2011, 5, 25-29
13. Hamid Bohlooli, Ali Nazari, Gholamreza Khalaj , Mohammad Mehdi Kaykha, Shadi Riahi (2011) "Experimental investigations and fuzzy logic modeling of compressive strength of geopolymers with seeded fly ash and rice husk bark ash"
14. D. A. Opeyemi, O. O. Makinde (2012) "The Suitability of Partial Replacement of Cement with rice Husk ash and Bone Powder in Concrete Structure" ISSN 2250-2459, Volume 2, Issue 9, September 2012
15. B. Damohara reddy, S. Aruna Jyothy & I. V. Ramana Reddy (2013) "Effect of Rice Husk ash on the properties of Ordinary Portland Cement and Portland Slag Cement With and Without Superplasticizer" ISSN 2249-6866 Vol. 3, Issue 2, Jun 2013, 1-8.

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A SYSTEMATIC REVIEW ON SPIRITUALITY & ACHIEVEMENTS OF ON WINGS OF FIRE

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Abstract:- Wings of Fire is an autobiography of APJ Abdul Kalam. It depicts the life of APJ Abdul Kalam who grew up as a renowned scientist to lead India's space research and missile development programmers. This paper throws light on the spirituality, science and achievements of APJ Abdul Kalam. The spirituality protects us from depression while achieving our goals and gives us patience against failure and difficulties. Kalam sees science and technology as ideology-free areas and emphasizes the cultivation of scientific temper and entrepreneurial drive. Besides being an eminent scientist, APJ Abdul Kalam is also a thought provoking writer. The rare confluence of scientific brilliance and wisdom in him is truly unique. Apart from his technological accomplishments, his writings are a great contribution to humanity. APJ Abdul Kalam became the 11th President of India from 2002 to 2007. Kalam, a recipient of India's three highest civilian awards – the Padma Bhushan, the Padma Vibhushan and the Bharat Ratna, was well known across India and abroad.

Keywords:- Spirituality, Science, Achievements, Humanity, and Religion.

1. INTRODUCTION

Autobiographies written in modern India are very remarkable. In Autobiography, Anderson defined autobiography by quoting Philip Lejeune's words found in Autobiographical Pact as: "a retrospective prose narrative produced by a real person concerning his own existence, focusing on his individual life in particular on the development of his personality." Mahatma Gandhi's My Experiments with Truth, Jawaharlal Nehru's An Autobiography, Srinivasa Sastri's My First Meeting with Gokhale, Dr. Sarvepalli Radhakrishnan's My Search for Truth, Vijayalakshmi Pandit's So I Became a Minister, and APJ Abdul Kalam's Wings of Fire are some of the famous Indian autobiographies.

Wings of Fire are an autobiography of APJ Abdul Kalam, former President of India, known as a missile man and rocket engineer. It deals with the story of Kalam's own rise from

obscurity and his personal and professional struggles as well as the story of Agni, Prithvi, Akash, Trishul and Nag. He was born in a middle-class Tamil family in the island town of Rameshwaram. His father had neither much formal education nor much wealth. Kalam's great strength lies in his understanding on himself, society and the nature of work.

He has a mind which can practically accept anything. He is spiritually bound and was not affected by the ordinary events of the world. He practically applied the idea of single-minded devotion to his goal throughout his life. Kalam discussed the major aspects of his personality that transformed him from a humble and rural person to an extraordinarily talented scientist, spiritual guru and the President of India.

2 SPIRITUALITY

The genesis of all greatness in humanity depends in their nurture and it is very true in case of Abdul Kalam. As a child he was very inquisitive and always questioned his father about divine power, human suffering and spirituality. The spirituality protects us from depression while achieving our goals and relieves us from stress, as well as gives us patience against failure and difficulties. It gives us hopes of achieving our dreams. APJ Abdul Kalam started Wings of Fire as the seeds of spirituality was rooted and ended it as if he attained spiritual fulfillment. Initially Kalam narrated as if he started to attain spiritual maturity with the companionship and observation of spiritually matured people who explained the mystic spiritual concepts and thoughts in an easy understandable language. Kalam closed Wings of Fire with the words:

- "I am a well in this great land
- Looking forward at its millions of boys and girls
- To draw from me
- The inexhaustible divinity
- And spread His grace everywhere
- As does the water drawn from a well."

Throughout the novel we may trace the various spiritual beliefs of Kalam that have tempered him into the person that he is. An indomitable spirit, replete with enthusiasm and hope, mark most of his literary expressions. He is a visionary who ushers in fresh ideas for a better tomorrow. His scientific explorations do not dissuade or dislodge his faith in God. In the words of Abdul Kalam: "I wonder why some people tend to see science as something which takes man away from God. As I look at it, the path of science can always wind through the heart. For me, science has always been the path to spiritual enrichment and self-realization."

Kalam's multiple identities are constructed on his spiritual

belief, which is based on the universal philosophies of major religions like Christianity, Hinduism and Islam. For example, "trials" are the basis for Christians, "karma" is the basis for Hindus and "prayer" is the basis for Muslim religion. Karma is a belief which explains that a person's actions cause certain effects in the current life or in future life positively or negatively depending upon the actions involved. Prayer is considered as one of the five pillars of Islam. Kalam's narration proves that he overcame many trials with patience and dedication.

He felt that he has a working partnership with God. In his early childhood, he learnt about the significance of prayer from his father. He narrated his life as if his spiritual belief helped him to overcome dilemma, failure and to contribute his best, which required more ability than he possessed. He also showed another quality that man should possess in order to get the blessing of God. As Kalam he says that he has always been a religious person in the sense that he maintains a working partnership with God. He believes that the best work requires more ability than he possesses and therefore he needs God's help.

In this partnership, he has always received all the power he needed and felt it flowing into him. He affirms that the kingdom of God is within us in the form of this power. This power helps to achieve your goal and realize your dreams. He may not be an example to others, but a few souls may draw inspiration and come to balance that ultimate satisfaction which can only be found in the life of the spirit. Kalam's father could convey complex spiritual concepts in very simple, down-to-earth Tamil.

He once told Kalam: "In his own time, in his own place, in what he really is, and in the stage he has reached- good or bad- every human being is a specific element within the whole of the manifest divine Being. So why be afraid of difficulties, sufferings and problems? When troubles come, try to understand the relevance of your sufferings. Adversity always presents opportunities for introspection."

3 SCIENCE

Kalam's belief in the power of science is to resolve society's problems and his views of these problems as a result of inefficient distribution of resources is modernistic. He also sees science and technology as ideology-free areas and emphasizes the cultivation of scientific temper and entrepreneurial drive. Besides being an eminent scientist, APJ Abdul Kalam is also a thought provoking writer. Abdul Kalam graduated from Madras Institute of Technology majoring in Aeronautical Engineering.

There were disappointments and distractions but his father's inspiring words anchored him in the periods of nebulous drift. In the words of Kalam: "He who knows others is learned, but the wise one is the one who knows himself. Learning without wisdom is of no use." Kalam was heavily involved in the development of India's first indigenous Satellite Launch Vehicle (SLV) while he was the Project Director. Since he was the Chief Executive of Integrated Guided Missile Development Programmed (IGMDP), he also played a major part in developing many missiles of India including Agni and Prithvi.

He has also served as the Chief Scientific Adviser to Defense Minister and Secretary, Department of Defense Research & Development. Pokhran-II nuclear tests were conducted during this period, led by him. APJ Abdul Kalam visited NASA's Langley Research Center in Hampton, Virginia and Goddard Space Flight Center in Greenbelt, Maryland. Kalam made an effort to develop the Polar Satellite Launch Vehicle (PSLV) and SLV-3 projects, both of which proved to be successful Agni, Prithvi, Akash, Trishul and Nag- the missiles that raised India's repute to international reckoning as a missile power.

4 ACHIEVEMENTS

Everything is possible to be achieved for anyone and every human being has got the capability and competency of doing something. The things an achiever requires are: first the desire of doing something within him, second the belief that he can achieve it and the last but not the least is the expectation from whatever the achiever does. In the words of Kalam: "To succeed in life and achieve results, you must understand and master three mighty forces- desire, belief, and expectation."

On Wednesday April 29, 2009, he became the first Asian to be bestowed the Hoover Medal, America's top engineering prize, for his outstanding contribution to public service. Kalam has received honorary doctorates from several universities, including the Carnegie Mellon University and the Nanyang Technological University of Singapore. The Government of India has honored him with the Padma Bhushan in 1981and the Padma Vibhushan in 1990. In the words of Kalam: "On Republic Day 1990, the nation celebrated the success of its missile programmed. I was conferred the Padma Vibhushan along with Dr. Arunachalam."

Kalam is the Third President of India to have been honored with the nation's highest civilian honour- the Bharat Ratna in 1997 for his work with ISRO and DRDO and his role as a scientific advisor to the Indian government- before being elected to the highest office,

the other two being Sarvepalli Radha Krishnan and Zakir Hussain. Kalam says about his personal achievements: "If someone asks me about my personal achievements in Indian rocketry, I would pin it down to having created an environment for teams of young people to put their heart and soul into their missions."8

Many politicians and scientists appreciated Kalam for his remarkable achievements.

After the success of Agni launch, Prime Minister Rajiv Gandhi said that Agni launch is: "a major achievement in our continuing efforts to safeguard our independence and security by self-reliant means. The technology demonstrating through Agni is a reflection of our commitment to the indigenous development of advanced technologies for the nation's defence. The country is proud of your efforts." Every individual creature on this beautiful planet is created by God to fulfill a particular role. Whatever Kalam has achieved in life is through God's help, as an expression of His will.

He showered His grace on Kalam through some outstanding teachers and colleagues and whenever Kalam pays a tribute to these fine people, he is merely singing His glory. Kalam says: "We are all born with a divine fire in us. Our efforts should be to give wings to this fire and fill the world with the glow of its goodness." Unlike Wings of Fire, Kalam started Turning Points with the climax of his presidential period and proceeded to narrate the story where Wings of Fire ends. The publisher of Turning Points wrote that: "Turning Points takes up the incredible Kalam story from where Wings of Fire left off.

It brings together details from his career and presidency. It offers insight not only into an extraordinary personality but also a vision of how a country with a great heritage can become great in accomplishment, skills and abilities through effort." Kalam has an astounding memory capacity that helped him to complete the scientific projects. In The Kalam Effect: My Years with the President, P. M. Nair expressed his admiration for Kalam's memory in these words: "memory was amazing – photographic and with plenty of films to register information."

Apart from his technological accomplishments, his writings are a great contribution to humanity. Dr. Sarvepalli Radha Krishnan says in My Search for Truth: "Science helps us to build up our outer life, but another discipline is necessary to strengthen and refine the living spirit".

5. CONCLUSION

Wings of Fire reveal a great imaginative power, looking ahead and grasping the truth that

underlies facts. It delineates a vision incorporating spirituality, science, and achievements of APJ Abdul Kalam. What Kalam observed from his experience is that people analyze the problems and failures instead of dealing with them. His life teaches many strategies to face challenges to lead a successful and fruitful life.

REFERENCES

1. Anderson, L. Autobiography. London: Rutledge, 2007, p. 20.
2. Kalam, APJ Abdul. Wings of Fire. Hyderabad: University Press (India) Private Limited, 1999, p. 177.
3. Ibid. p. 15.
4. Ibid. p. 4-5.
5. Ibid. p. 17.
6. Ibid. p. 12.
7. Ibid. p. 159.
8. Ibid. p. 169.
9. Ibid. p. 153
10. Ibid. p. xvi.
11. Kalam, APJ Abdul. Turning Points. New Delhi: Harper Collins Publishers, 2012, Back cover.
12. Nair, P. M. The Kalam Effect: My Years with the President. Delhi: Harper Collins, 2008, p. 18.
13. Radha Krishnan, Dr. Sarvepalli. My Search for Truth. New Delhi: Hindu Pocket Book, 1995, p. 22.

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A RESEARCH AND REVIEW ON ARUN JOSHI'S NOVEL

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Abstract:- Arun Joshi is one of the most qualified existentialists in the canon of Indian English literature. The City and the River' is the fifth and the last novel of Arun Joshi. He is the winner of the most prestigious award Sahitya Akademi. His novels are singularized by certain existentialist problems and the resultant anger, agony, psychic quest etc. His novels are strongly influenced by the existential philosophy of Satre, Albert Camus' and Kierkegaard. The researcher's attempt is to explore the elements such as frustration, disintegration, rootless ness, a sense of alienation and existential predicament in The City and the River'.
Keywords:- frustration, disintegration, rootless ness, a sense of alienation and existential predicament.

1. INTRODUCTION

Existentialism is the modern philosophic movement. It deals with man's disillusionment and despairs. His fictional world is a revelation of a world where man is confronted by the self and the question of his existence. In fact, existentialism is a powerful revolt against reason, rationality, positivism and the traditional ways in which early philosopher portrayed man. The exponents of existentialism strongly described man's autonomy, his self-assertion, his reason and rationality, his denial of traditional values, his exercise of will and freedom, his experience of the absurdity and the nothingness of life. H. Abrams, a Glossary of Literary Terms, 1971:86). It is an existential issue on the absurdity of human life. Through this novel, the author explores existential and hostile world. Existentialism is the essence of the novel. Ramesh Srivastava comments that "Most of Arun Joshi's Heroes are alienated beings".

1.1 The City and the River: An Existential Novel

The city that Joshi has designed stands for power structure in the society where there is a struggle between the two classes i.e. powerful and powerless. The City and the River (1990) is a critical

study of existentialism of its archetypal characters. Throughout the novel, these characters carry a sense of alienation, loneliness, absurdity and pessimism with them. The novel depicts the existential dilemma of its characters in hostile world but this predicament is replaced by the socio-political crisis of the city, which is a mixture of individuals and can be said to represent the whole humanity.

The novel describes the conflict between the Grand Master and the Boatmen. The Grand Master, who rules the City by the river, is determined to become its unchallenged king. His intentions are reinforced by the existence of an old prophecy. He demands the allegiance from the Boatmen. Master Bhoma, (Bhumiputra) and other rebellions of the boatmen stubbornly insists on offering allegiance to the river alone. The image of the novel is central to the novel. The treatment of the river by the Grandmaster emphasizes the advent of skepticism whereas faith by the boatmen. The boatmen consider the river as a symbol of the divine mother and grandmaster thinks it as a stream of water.

He considers astrologer's pleas and boatmen's beliefs as a mere superstition. In fact, the great river is the embodiment of the eternal time which destroys the city completely whenever sin and evil dominate the life of its people. Dhawan asserts that "The River is the life enhancing means which washes away the sins of the city and the cyclic march of the civilization continues." (Dhawan, 1922: 262). The Boatmen's leader, Headman tells that they owe their allegiance. "We have no quarrel with the Grand Master and we have no quarrel with you.

If it is a matter of allegiance, our allegiance is only to the river and cannot be shared." (19). they regard themselves as "children of the great river" (19). They consider the river as a symbol of the divine mother, of god himself. (22) Their refusal creates the conflict- the conflict between The City and the River, between the Grand Master and the boatmen, between the urge to dominate and the desire to assert one's identity. This conflict is the life and the soul of the plot. The novel highlights the contrast between the grandmaster's and Boatmen's outlook and belief towards life.

Disturbed by the continuous oppression, the boatmen take a vow to go on a strike. "O my mother, I am a nameless boatman of this city of gold. O my mother, I have become the play thing of my oppressor, who is blind and who is deaf. I vow that until my oppressor opens his ears to my lament not a boat, not a leaf, not even a piece of straw shall pass down your sacred waters." (178-179)

2. UNNATURAL AND CHAOTIC CITY

The atmosphere of the City is absolutely unnatural and chaotic. The city in the novel is itself rootless and alien to the natural atmosphere. Arun Joshi quotes, "In the city's newly laid parks and along its well-straightened avenues and on the Seven Hills, however, in spite of the chief horticulturist's strenuous efforts, and to the Grand Master's great regret, neither grass nor flowers grow". (136). in this “city of wonders”, the people, except boatmen, are generally “subdued and not [in] their normal self” (96).

There is “nothing to change, no new idea to survive” (55) in the city. In it “nothing was moving in the right direction or, if anything was, it move at a snail’s pace” (55) and hence everyone “was waiting for something to happen” (55). “Chaos is pilled upon chaos” (180) is the final impression of the city, in such a setting, the characters feel their existence rootless, absurd and are in search for something meaningful. Life seems to them as merely “a strange sorry tale” (10) comprising “pointless episodes”.

2.1 Existentialistic examples

The Master of Rallies, a child of boatman, is “an unhappy man” (71) and the real cause of his unhappiness is footlessness. His misfortune lay in the fact that instead of teaching him how to row a boat his parents had wanted him to join the ranks of the brick-people. For fifteen years, they spent all their earning on him. The Master of Rallies was good at studies but after fifteen years when he completed them, like the Education Advisor, he too discovered that no one wanted his services.

The boatmen did not have the money to hire him; the brick-people considered him an upstart (71). He appears as “tired” (76), ‘afraid of humiliation” (75) and at “no peace” (76). He says, “I have no family, no wish to get rich. I do not wish to become famous; I have no friends to lose. Am I afraid of going to prison? In fact I (am, but why?). There is no one to mourn me, nor do I have commitments that would suffer”. (75). It accounts his alienation and footlessness.

2.2 The Professor

The professor, a star watcher and a teacher of Master Bhoma, apart from his scholarship is weary and tired “I am tired of being careful. I am weary” (87) his search for Bhumiputra “had turned into a search for some lost bit of himself” (159). His quest leads him to imprisonment at Gold Mines. He expresses in disgust: “Forgive me; I have spent my life in sleep. My life has been a joke, even as the lives of brick- people are a joke I have

squandered it on baubles" (163). In extreme sorrow, he expresses "I am lost".

He is crushed by solitudes and weight of human misery. Even Bhumiputra, a teacher of Mathematics and disciple of professor "felt very alone" (157). He was forced to roam in wilderness, after having the feeling of "wandering through a desert land" (176). He finds the meaning of his life not in escape but in action. He decides to fight with Grand Master. He excites the demoralized boatmen by reminding them that they are children of the sacred river and they should not sell their soul to a man however powerful he may be. But soon, "A sense of overwhelming futility filled him at such times, so much so that he saw no point in living" (174). Sometime, he feels "so old and lonely and useless" (150).

The case of the Grand Master is not very different. The minister for Trade frankly tells the Grand Master that he is "tired" (203) and that in his "weariness" (203) he lets "his dark thoughts assail" (203) him. The music "disturb" (203) him. He hears "within its notes the echoes of a mocking laugh" (203). The delay in the prophecy's fulfillment and the growing anger of the people make the headstrong Grand Master impatient. He suffers from a crisis of trust and grows suspicious of his own advisers: "Who is there in the wider world that I can trust?" (57).

2.3 Dharma's father

Dharma's father is a profiteer who suffers from a strange kind of disease. He feels like crying, yet cannot cry. He stands before mirror and raves. A hole appears in his image reflected in the mirror and he begins to think, that "My insides are rotting. I too am vanishing (133). He is damned to suffer from the "Three Truths Syndrome, stasis of the soul Atrophy of the brain and locomotors functions" (135). The stiffness of his joints is symptomatic of the hardening of his soul.

His condition degenerates each day so much so that "his mind turned blank, [and] his will was reduced to zero" (134). His doctor tells him in good faith: "Exercise your soul" (134) as medical treatment will not cure him. Dharma, a Police Officer, too, feels alienated. When The Grand trader offers him a silver chair to sit on, he finds it "surprisingly uncomfortable" (91) Dharma wonders how a Grand Trade is in league with powerful persons with whom he shares his profits. After knowing it, in his anguish, "For many weeks, he had been having trouble deciding whether he was living in a city that he used to know" (93).

Thus the prominent characters in the novel, suffer from existential predicament for different reasons. Sharma rightly says, "They suffer from alienation, weariness, boredom, rootless ness, meaninglessness in their lives" (2003:84). They are tormented by their hollow existence. Joshi is obsessively occupied with the individual's quest for meaning and value, freedom and truth that provide spiritual nourishment to the estranged self in a seemingly chaotic and meaningless world.

3. CONCLUSION

Existential conflict in Joshi springs from the self's craving for the fulfillment of certain psycho-emotional needs, from the desire to overcome the horror of separateness, of powerlessness and of listlessness. Thus the novel comments upon the futile existence of the oppressed class using the element of allegory and fantasy. Joshi reiterates the significance of human values. The novel suggests that the ruin of the city or society can be done if it is lead by selfishness, corruption and evil powers. Joshi skillfully illumined the major concern of existentialism, frustration, disintegration, footlessness, a sense of alienation, existential predicament and absurdity through this novel.

REFERENCES

1. Prasad, Madhusudhan. Arun Joshi In Indian English novelists: An Anthology of Critical Essays (ed), New Delhi, Sterling, 1982, 51.
2. Gupta Balarama Studies in Indian Fiction in English, Gulbarga, JIWE, Pub 1987, 46.
3. Srivastava RK, Six Indian Novelists in English, Amritsar, Guru Nanak Dev University, 1987, 312.
4. Dhawan RK. (ed), The Fictional World of Arun Joshi, New Delhi, Classical Publishing Company, 1986, 18.
5. Sarma Bramha Dutta The City and the River as a Political Novel, Ed. RK Dhawan, 245.
6. Beniwal Anup. The City and the River A Cricitcal Review", The Novels of Arun Joshi, Ed. R.K. Dhawan, op. cit., 275.
7. Abrams MHA Glossary of Literary Terms Delhi: Macmillan India Limited, 1971.
8. Bhatnagar OP. Indian Writing in English, New Delhi: Atlantic Publishers and Distributors. 1999.
9. Dr. SP. Samartray Mrs S "The Problem of Alienation and the Quest for Identity in Joshi Novels. 1999.
10. Navale, Arvind. The Criterion: An International Journal in English 1(3) 2010 ISSN 0976-8165.

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AN APPLICATION OF SOME TOPOLOGICAL OPERATORS VIA GRILLS: A STUDY

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Abstract- In this paper, we define and study two operators Φ^s and Ψ^s with grill. Characterization and basic properties of these operators are obtained. Also, we generalize a grill topological spaces via topology τ^s induced from operators fis and *s*.

Keywords: Grill, topological spaces, fi$^{\Phi^s}$ and Ψ^s.-operators and *fisG*

1. INTRODUCTION

The concept of grill topological spaces depended on the two operators are Φ and ΨThe first to introduce this concept by Choquet [3] in 1947. This concept is similar to the concept of ideals, nets and filters. Some theories and characteristics of the topological spaces with grill on both sets and functions has been studied in [1, 2, 4, 5, 12]. Also for the investigation of many topological notions similar compactifications, proximity spaces and extension problems of difierent kinds [See 7, 8, 9, 13]. In [11] Roy and Mukherjee introduce grill topological space *fiG*, some other characterizations and also the relationship between *fi* and *fiG*. Our purpose in this paper, is to define and study new operators Φ^s with grill. Characterization and basic properties of these operators are obtained. Also, we generalize a grill topological spaces via topology *fi s* induced from operators Φ^s and Ψ^s.

Definition 1.1 A subset *A* of topological space (*X; fi*) is called semi-open set [10] if $A \subseteq Cl(Int(A))$ where $A \subseteq X$ and it;s called semi-closed set [6] if $Int(Cl(A)) \subseteq A$, for $A \subseteq X$. $sCl(A)$ symbol expresses the intersection of all semi-closed sets of (*X; fi*) containing *A* and it is called the semi-closure of *A*. The family of all semi-open (resp. semi-closed) sets of (*X; fi*) is denoted by $SO(X,\tau)$

2. PRELIMINARIES

While taking our idea in this research, some symbols such as *X*, *Int*(*A*) and *Cl*(*A*) are using to mean *X* carries topology *fi* , interior and closure of a set *A*

in (X,τ) whenever $A \subseteq X$. Also, $P(X)$ will be written to mean the power set of X. A collection G of nonempty subsets of X is named a grill ([3]) if

(i) $\phi \notin G$,
(ii) $A \subseteq B \subseteq X$ and $A \in G \Rightarrow B \in G$,
(iii) $A, B \subseteq X$ and $A \cup B \in G \Rightarrow A \in G$ or $B \in G$.

For instance, let R be the set of all real numbers. Consider a subset $G = \{A \subseteq R : m(A) \neq 0\}$, where $m(A)$ denotes the Lebesgue measure of A, then G is a grill.

Remark 1 *(1)-The minimal grill is $G = \{X\}$ in the space (X,τ).*
(2)-The maximum grill is $G = P(X)\backslash\{\phi\}$ in any topology τ on the space X.

Definition 2.1 (see [11]) Let (X,τ,G) be a grill topological space. An operator $\Phi : P(X) \to P(X)$ is defined as follows: $\Phi(A) = \Phi_G(A,\tau) = \{x \in X : A \cap U \in G$ for every open set U containing $x\}$ for each $A \in P(X)$. The mapping Φ is called the operator associated with the grill G and the topology τ.

Definition 2.2 (see [11]) Let G be a grill topological space (X,τ). Then we define a map $\Psi : P(X) \to P(X)$ by $\Psi(A) = A \cup \Phi(A)$ for all $A \in P(X)$. The map Ψ is a kuratowski closure axioms. Corresponding to a grill G on a topological space (X,τ), there exists a unique topology τ_G on X given by $\tau_G = \{U \subseteq X : \Psi(X \setminus U) = X \setminus U\}$, where for any $A \subseteq X, \Psi(A) = A \cup \Phi(A) = \tau_G - Cl(A)$. For any grill G on a topological space (X,τ), $\tau \subseteq \tau_G$. If (X,τ) is a topological space with a grill G on X, then we call it a grill topological space and denote it by (X,τ,G).

***Example* 2.3** (see[11]) Let τ denote the cofinite topology on a uncountable set X and let G be the grill of all uncountable subset of X. Then it is clearly $\tau \setminus \{\phi\} \subseteq G$. We show that τ_G is the countable topology which is denoted by τ_{co} on X. If $V \in \tau_G$, then $V = U \setminus A$ where $U \in \tau$ and $A \notin G$ implies that $(X \setminus U)$ is finite and A is countable. Now $X \setminus V = X \cap (X \setminus V) = X \cap (X \setminus (U \cap (X \setminus A))) = X \cap ((X \setminus U) \cup A) = (X \setminus U) \cup A$ which is countable and hence $V \in \tau_{co}$. On the other hand if $V \in \tau_{co}$ implies that $X \setminus V = A \notin G$ and hence $V = X \setminus A$, where $X \in \tau$ and $A \notin G$ so $V \in \tau_G$. Thus $\tau_G = \tau_{co}$.

Lemma 2.4 (see[11]) For a grill topological space (X,τ,G), $\tau \subseteq B(G,\tau) \subseteq \tau_G$, where $B(G,\tau) = \{V \setminus A : V \in \tau and A \notin G\}$ is an open base for τ_G.

***Example* 2.5** (see[1])Let (X,τ) be a topological space satisfying conditions of a grill. If G contains all power set of X except null-set, it is obvious that $\tau_G = \tau$. Since for any τ_G-basic open set $V = X - A$ with $U \in \tau$ and $A \notin G$, we have $A = \phi$, so that $V = U \in \tau$. Hence by Lemma 2.5 we have in this case $\tau = B(G,\tau) = \tau_G$.

3. NEW OPERATORS VIA GRILLS

In this section, we define and study new operators Φ^s and $\Psi^s$with grill. Characterizations and basic properties of these operators are obtained. Also, we generalize a grill topological spaces via topology Φ^s and $\Psi^s$and s

Definition 3.1 Let (*X; fi*) be a topological space and *G* be a grill on *X*. We define a mapping $\Phi^s : P(X) \to P(X)$, denoted by Φ^s_G for $A \in P(X)$ (simply $\Phi^s(A)$), called the operator associated with *G* and *fi* which is defined by $\Phi^s_G(A) = \{x \in X : U_x \cap A \in G, \forall U_x \in SO(X,\tau)\}$ $\forall A \in P(X)$.;

4. CONCLUSION

The study of grill topological spaces generalized most of near open sets and near continuous function. So we introduced a new operators Φ^s_G , Ψ^s_G and relationships between this operators and the old Φ_G, Ψ_G. Also, we introduce a generalization to a grill topological space (X, τ, G).

REFERENCES

1. A. Al-Omari, T. Noiri, Decomposition of continuity via grilles. Jordan J. Math and Stat., 4 (1) (2011), 33-46.
2. C. W. Baker, Slightly precontinuous functions. Acta Math. Hungar., 94 (1-2)(2002).
3. G. Choquet, Sur les notions de filter et. grill. Completes Rendus Acad. Sci. Paris, 224 (1947), 171-173.
4. K. C. Chattopadhyay, O. Njastad and W. J. Thron, Merotopic spaces and extensions of closure spaces. Can. j. Math., 35 (4) (1983), 613-629.
5. K. C. Chattopadhyay and W. J. Thron, Extensions of closur spaces. Can. j. Math., 29 (6) (1977), 1277-1286.
6. S. G. Crossely and S. K. Hildebrand, Semi-closure. Texas J. Sci. (2+3) (1971), 99-119.
7. E. Hater and S. Jafari, On Some new Classes of Sets and a new decomposition of continuity via grills. J. Adv. Math. Studies, 3(1) (2010), 33-40.
8. R. C. Jain, The Role of Regularly Open Sets in General Topology, Ph.D. Thesis. Meerut Univ., (Meerut, India, 1980).
9. D. Mondal and M.N. Mukherjee, On a class of sets via grill: A decomposition of continuity. An. St. Univ. Ovidius Constanta, 20 (1) (2012), 307-316.
10. N. Levine, Semi-open sets and semi-continuity in topological spaces. Amer, Math. Mounthly, 86 (1961), 44-46.
11. B. Roy and M. N. Mukherjee, On a Typical Topology Induced by a Grill. Soochow Journal of Math., 33, No. 4 (2007), 771-786.
12. R. Staum. The algebra of bounded continuous functions into a nonarchimedian field. Pacific J. Math., 50 (1974), 169-185.
13. W. J. Thron, Proximity structure and grills. Math. Ann. 206 (1973), 35-62.

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A REFERENCE STUDY AND REVIEW FOR PREORDER RELATORS WITH GENERALIZED TOPOLOGIES IN GRAPH SYSTEM

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Abstract- In this paper we investigate generalized topologies generated by a sub base of Preorder relators and consider its application in the concept of the complement. We introduce the notion of principal generalized topologies obtained from the new type of open sets and study some of their important properties.
Keywords: Generalized topology, preorders relator, principal generalized topology.

1. INTRODUCTION

The concept of generalized topology was introduced by 'A. Cs'asz'ar [3, 4]. It is devoted to the study of kinds of subsets of a topological space are often generalized the notion of open sets. He and many other authers have extensively studied on important properties and various results in framework of the type of generalizations. Here we recall some definitions and the most essential concepts needed in our work.

Let X be a nonempty set and the collection fi ıbe a subset of the power set $P(X)$. Then fi is called a *generalized topology* (briey GT) on X if it contains $\emptyset$ and any union of elements of fi belongs to fi. Therefore every topology is a generalized topology. We call the pair $(X; fi)$ a generalized topological space on X. The family of all generalized topologies defined on X denote by $GT(X)$. The elements of fi are called *fi-open* sets and the complements are called *fi-closed* sets. It is quite natural that a considerable part of the properties of generalized topologies can be deduced from suitable more general definitions. The family of all generalized topologies on a set, partially ordered by set inclusion is a bounded lattice, neither distributive nor complemented which discussed in [1]. According to [10], Steiner have been studied the structure of the lattice of principal general topologies, employing the notion of ultra topology. Every preorder relation is induced by a principal general topology. In fact, there is a canonical isomorphism between the lattice of principal topologies and the lattice of preorder relations on a set [7, 8, 10]. The aim of the present paper is to show that all generalized topologies

derived from the corresponding preorder relations and to get some unknown results by special choice of the generalized topology, the so called *principal generalized topology*. Principal generalized topologies are then characterized by properties of generalized open sets, analogous to some topological concepts of ultra topologies

2. GENERALIZED TOPOLOGIES GENERATED BY PREORDER RELATORS

In this section, we start with recalling some basic facts concerning (preorder) relators on

a set. Let X be a nonempty set and $X^2 = X \times X$ A subset R of $X2$ is called a relation on X. In particular, $\Delta_X = \{(x,x) | \ x \in X\}$, the diameter of X is called the identity relation on X. For any x 2 X and subset A *fi* X, the sets $R(x) = \{y \in X | \ (x,y) \in R\}$ $R(a)$ are said to be the image of x and A under R, respectively. The inverse relation $R\square 1$ can be defined as $R\square 1(x)$ = *fy 2 Xj x 2 R*(*y*)*g* for all x 2 X.We may briey write $R2$ instead of R *fiR*, the composition relation defined by (R *fiR*)(x) = $R(R(x))$ for any x 2 X. A relation R on X is reexive, symmetric and trasitive if ΔX *fi* R; $R\square 1$ *fi* R and $R2$ *fi* R. A reexive and transitive relation may be called a preorder relation on X.

A family R of relations on X is called a relator on X. Moreover, the pair $X(R)$ = (X;R)is said to be a relator space. Relator spaces are natural generalization of ordered sets. Therefore, all generalizations of the usual topological structures can be derived fromrelators according to [2, 9]. A relator R on X may be called reexive, symmetric and transitive if each of its members has the corresponding property. Thus, we may also naturally speak of preorder relators. introduced in [5, 10]. By this purpose, we obtain generalizations of results in [1, 6].

Theorem 2.7 If $\emptyset \neq \mu \subsetneq \mathcal{P}(X)$, then the following statements are equivalent:

(i) μ is a GT on X.
(ii) $\mu = \mathcal{T}_{\mathcal{R}_\mu}$.
(iii) $\mu = \mathcal{T}_{\mathcal{R}}$ for some preorder relator $\mathcal{R}$ on X.

Proof. $(i) \Rightarrow (ii)$: for any $A \in \mu$ we have $R_A(A) = A$ and thus $A \in \mathcal{T}_{\mathcal{R}_\mu}$ so $\mu \subset \mathcal{T}_{\mathcal{R}_\mu}$. Let $V \in \mathcal{T}_{\mathcal{R}_\mu}$, with $V \neq X$, then by Theorem (2.6), there exists $\mathcal{B} \subset \mu$ such that $V = \bigcup \mathcal{B}$. Since $\mu \in \mathcal{GT}(X)$, A is closed under arbitrary unions. Therefore, $V \in \mu$ and $\mathcal{T}_{\mathcal{R}_\mu} \subset \mu$. Thus (ii) holds. The implications $(ii) \Rightarrow (iii)$ and $(iii) \Rightarrow (i)$ are immediate from Theorem (2.4) and Theorem (2.6). ■

Corollary 2.8 There is a (not necessarily one to one) correspondence between proper GT's on X and preorder relators R on X.

3. COMPLEMENTED GENERALIZED TOPOLOGIES

Let $\mu, \eta \in \mathcal{GT}(X)$. We denote the intersection (the meet) of μ and η by $\mu \wedge \eta$. We have shown in [1], it is a generalized topology on X contained in both. As we know that the union of two generalized topologies need not be a generalized topology. Denote the join of μ and η by $\mu \vee \eta$. It is also the smallest generalized topology on X containing both of them [1].

Example 3.2 (a) Let Y be proper nonempty subset of X and $\mu = \mathcal{P}(X)$, then $\mu^c = \mathcal{P}(X \setminus Y)$ is a complement of μ. is a complement of .

(b) Let $X = \{1, ..., n\}$ and $\mu = \{\emptyset, X, X - \{i\} \mid i = 1, ..., n\}$ is co-singleton GT on X.

Then it has no complement.

Lemma 3.3 If $\mu \in \mathcal{GT}(X)$ and μ^c exists, then for a preorder relator $\mathcal{R}_\mu$ on X we have $\mathcal{R}_\mu^{-1} = \mathcal{R}_{\mu^c}$.

Proof. It evidently follows from Lemma (2.2) and Lemma (2.3).

Concerning the concept of the complement in generalized topology theory and accoding to Theorem (2.11) cf.[1], we can imply that $(\mathcal{GT}(X), \wedge, \vee)$ is a lattice with the botton element *fØg* and the top element *P*(*X*) such that satisfies the commutative, associative and attractive properties but neither distributive nor complemented.

Theorem 3.4 (Theorem 2.6, [1])

[1]) Let μ be a GT on X. Then μ^c exists iff for any $A \in \mu$, there exists *x*0 *2 A* such that $\{x_0\} \in \mu$.

Corollary 3.5 In general, for any nonempty subset *L* of *X*, *P*(*L*) is the unique comple-ment of generalized topology $(\mathcal{P}(X) \setminus \mathcal{P}(L)) \cup \{\emptyset\}$. Consider μ is a generalized topology on *X* and the complement μc exists. From Theorem (2.9) in [1] we can see that ∧ *fic* = *P*(*L*) is the smallest complement of μ, where $L = X \setminus \{x \in X \mid \{x\} \in \mu\}$ but the set ∨ μc, the join of all complements of μneed not be also a complement of μ.

Here, if $\mu = \mathcal{P}(L)$ then $\bigvee \mu^c = (\mathcal{P}(X) \setminus \mathcal{P}(L)) \cup \{\emptyset\}$ as the maximum complement of μ (i.e. the largest element of the set of all complements of μ under the relation $\subseteq$).

***Example* 3.6** Let $X = \{a, b, c\}$ and $\mu = \{\emptyset, \{b\}, \{c\}, \{b, c\}, X\}$ is a GT on X. Then $\lambda_1 = \{\emptyset, \{a\}, \{a, b\}\}$ and $\lambda_1 = \{\emptyset, \{a\}, \{a, c\}\}$ are two complements of μ. But $\lambda_1 \vee \lambda_2 = \{\emptyset, \{a\}, \{a, b\}, \{a, c\}, X\}$ is not a complement of μ.

Theorem 3.7 Let $\mu \in \mathcal{GT}(X)$ be a proper GT and has nonunique complements. Then μ satisfies T_1-axiom iff μ has not the maximum complement in $\mathcal{GT}(X)$.

Proof. ($\Rightarrow$) Assume $\mu \in \mathcal{GT}(X)$ with $\mu \neq \mathcal{P}(X)$ and μ^c exists but not unique. Since μ is T_1, then there exists a point $x \in X$ such that $\{x\}$ is not in μ (if not, being closedness of μ under unions, it is equal to $\mathcal{P}(X)$, a contradiction). So $\{x\}$ has to be in μ^c. Hence μ^c contains all x where $\{x\}$ does not belong to μ. Since μ^c is a GT, according to Theorem (2.7) (ii) we have $\mu^c = \mathcal{T}_{\mathcal{R}_{\mu^c}}$ and using Lemma (3.3), $\mu^c = \mathcal{T}_{\mathcal{R}_\mu^{-1}} \subsetneq \mathcal{P}(X)$. It means that μ^c properly contains $\mathcal{P}(L)$ where $L = X \setminus \{x \in X |\ \{x\} \in \mu\}$ and $\mathcal{P}(L)$ is the smallest complement of μ. But $\mu \vee \mu^c = \mathcal{P}(X)$, it implies that $\mu \subsetneq (\mathcal{P}(X) \setminus \mathcal{P}(L)) \cup \{\emptyset\}$. Thus μ has not the maximum complement.

REFERENCES

1. R. Baskaran, M. Murugalingam and D. Sivaraj, Lattice of generalized topology, Acta Math. Hungar., 133 (4) (2011), 365-371.
2. A. Csfiaszfiar, Foundations of General Topology, Pergamon Press, London, 1963.
3. A. Csfiaszfiar, Generalized open sets, Acta Math. Hungar., 75 (1997), 65-87.
4. A. Csfiaszfiar, Generalized topology, generalized continuity, Acta Math. Hungar., 96 (2002), 351-357.
5. A. Csfiaszfiar, Ultra topologies generated by generalized topologies, Acta Math. Hungar., 110 (1-2) (2006), 153- 157.
6. E. Ekici and B. Roy, New generalized topologies on generalized topological spaces due to Csfiaszfiar, Acta Math. Hungar., 132 (1-2) (2011), 117-124.
7. R. E. Larson and S. J. And ima, The lattice of topologies: a survey, Rockey Mountain J. Math., 5 (2) (1975), 177-198.
8. F. Lorrian, Notes on topological spaces with minimal neighborhoods, Amer. Math. Monthly, 76 (1969), 616-627.
9. A. Szfiaz, Minimal structures, generalized topologies, and ascending systems should not be studied without ,generalized uniformities, Filomat, 21 (2007), 87-97.
10. A. K. Steiner, The lattice of topologies: structure and complementation, Trans. Amer. Math. Soc., 122 (1966), 379-397.

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CHARACTERIZATION AND PROPERTIES ANALYSIS FOR THE ANTIMICROBIAL PROPERTY OF QUATERNISED COPOLYMERS N-VINYLPYRROLIDONE - DIMETHYL AMINO ETHYL METHACRYLATE: REVIEW

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Abstract- N-vinylpyrrolidone - Dimethyl amino ethyl methacrylate (NVP-DMAEMA) is a copolymer containing an antimicrobial monomer hence exhibits antimicrobial property. NVP-vinyl benzyl chloride (NVP-VBC) is another copolymer with chloride functional group which makes it antimicrobial. Quaternization of these will enhance the antimicrobial property. The copolymers NVP-DMAEMA and NVP-VBC are synthesized by free radical mechanism. The obtained copolymers are quaternized with suitable reagents. Copolymers and quaternized salts are characterized by Fourier transform infrared and nuclear magnetic resonance. The antimicrobial property of these compounds is investigated by agar well diffusion method. Two Gram-positive bacterial strains used are Bacillus pumilus – 1640 and Staphylococcus aureus – 3160, two Gram-negative bacterial strains are Escherichia coli – 45 and Enterobacter aerogenes – 2822. The fungal strains used are Fusarium oxysporum – 2087, Aspergillus niger – 4325, and Penicillium sp. All compounds are showing better inhibition zones.

Keywords: N-vinylpyrrolidone-Dimethyl amino ethyl methacrylate, N-vinylpyrrolidone-Vinyl benzyl chloride, Fourier transform infrared.

1. INTRODUCTION

Antimicrobial molecules are substances which are capable of killing microbes such as bacteria, fungi, and virus. Conventional antimicrobial molecules are chemicals with smaller molecular weight. One of the disadvantages of these is there residuals. Even though the molecules successfully deactivate the microbes, their residues are toxic to the environment.

Polymers are the molecules with high molecular weights. One of the important criteria for a molecule to be antimicrobial active is its functional group. If a polymer is prepared by introducing such

functional group, it becomes antimicrobial active. The polymers which are capable of killing the microorganisms are grouped as antimicrobial polymers.

One of the ways of synthesizing antimicrobial polymer is by quaternizing the polymer to get quaternary ammonium and quaternary phosphonium salts. Cell walls of microbes are negatively charged. The positive charged molecules are easily adsorbed on them. Quaternary salts of ammonium and phosphonium contain positively charged groups.

Adsorption of these is favored when compared to the other antimicrobial polymers. N-vinylpyrrolidone (NVP) is a biocompatible monomer with low cytotoxicity. The two donor atoms oxygen and nitrogen present in it makes it hydrophilic [1-3]. As it can form many copolymers with a variety of monomers [4-8].

Both homo and copolymers of NVP find their applications not only as biologically active compounds but also as sorbents, coagulants, and flocculants [14-16]. Its copolymers are also used in cancer treatment [17], blood purification therapy [18] and as antiviral[19]. N, N-dimethyl amino ethyl methacrylate (DMAEMA) is a water soluble, mono functional acrylate monomer.

Poly (N, N-DMAEMA) (pDMAEMA) can inhibit the growth of bacteria on different materials, viz., glass, filter paper and plastic. Its antibacterial activity may be increased by quaternization because quaternization enhances the positive charge density and amphipathic character of its copolymer and polymer.

4-vinyl benzyl chloride (VBC) is dual functional monomer. It contains a benzyl group, chloride group, and a double bond. Its copolymers can also be quaternized and used as membrane in alkaline cells. The quaternized copolymer with 2-chloroethylvinylether exhibits antimicrobial property against a wide range of microbes.

Copolymerization of NVP with N, N-diethyl amino ethyl methacrylate results in an antimicrobial copolymer which can be quaternized with ethyl bromide to enhance the antimicrobial nature. Similarly, NVP can also be copolymerized with VBC and further quaternized with triethylamine and triphenylphosphine to get a group of antimicrobial compounds. In the present work, we are comparing the antimicrobial activity of the all the compounds with suitable standard agents.

2. EXPERIMENTAL

2.1. Materials

NVP (Sigma-Aldrich), VBC, and N, N-DMAEMA (Kodak company, USA) were mixed with Fuller's

earth separately and kept overnight to settle. The supernatant liquid was collected separately. 2-azo-bisisobutyronitrile (AIBN) (Chems Worth, Surat, India), acted as initiator, triethylamine (SD Fine Chemicals, Mumbai, India), triphenylphosphine (Himedia, Mumbai, India), ethyl bromide (Chems Worth, Surat, India) which act as quaternizing agents and other solvents were used as received from S D Fine Chemicals.

2.2. Microbial Strains

Antimicrobial activity was screened by Agar well diffusion method against two Gram-positive bacterial strains, Bacillus pumilus–1640 and Staphylococcus aureus–2822, two Gram-negative bacterial strains, Escherichia coli–45 and Enterobacter aerogenes–2822. The fungal strains used were Fusarium oxysporum– 2087 and Aspergillus niger–4325 collected from Microbial Type Culture Collection, Chandigarh. Penicillium sp. fungus was extracted from soil by the students of SIT, Tumkur, and Karnataka, India.

2.3. Synthesis and Quaternization of the Copolymers

NVP and N, N-DMAEMA were taken in 1:1 molar in three necked round bottom flask. 0.5 g of AIBN was added to the same flask which acts as initiator. Ethyl alcohol added acted as solvent. The mixture was heated at 65°C under nitrogen atmosphere for 6 h. A thick viscous liquid formed was washed well with acetone and dried at 40°C in vacuum.

This is named as D. The copolymer was dissolved in ethyl alcohol and required amount of ethyl bromide was added to it. This solution was stirred continuously for 6 h in a water bath maintaining a temperature of 60°C. The reaction was stopped after duration of 6 h and washed with 1, 4-dioxane solvent. It was reprecipitated with acetone and dried under vacuum at 40°C (Figure 1). The monomers NVP, VBC in equimolar concentration and solvent 1, 4-dioxane, initiator AIBN were taken in round bottom three necked flask.

The polymerization process was conducted at 70°C with continuous stirring for about 6 h in an oil bath by maintaining inert atmosphere with nitrogen gas. When the reaction mixture became thick viscous liquid, the polymerization process was stopped and the mixture was cooled to 30°C. With the mixture of diethyl ether/hexane the copolymer was washed well to remove residual monomers.

2.4. Copolymer Characterization

Copolymers were characterized by Fourier transform infrared (FTIR)

spectroscopy using Jasco FTIR at Sapala Organics Private Limited, Hyderabad, on KBr pellets in the range of 400-4000 cm^{-1}. The nuclear magnetic resonance (NMR) spectrum of both proton and carbon (H1 NMR and C^{13} NMR) for copolymers were recorded in Brucker AV – 300 spectrometer at Sapala Organics Private Limited, Hyderabad.

2.5. Antimicrobial Activity Test

Antimicrobial activity was screened by Agar well diffusion method against four bacterial strains (two Gram-positive and two Gram-negative) and three fungal strains. Nutrient agar culture medium plates were prepared and swabbed using sterile L-shaped glass rod with 100 µl of 24 h mature broth culture of individual microbial strains. The wells were made using sterile cork borer of 6 mm diameter. The pure solvent dimethyl sulphoxide (DMSO) is used as negative control. The compounds of different volumes were dispersed in the same solvent.

Simultaneously the standard antibiotic streptomycin sulfate (5µg/50µl) for bacteria and fluconazole (5µg/50 µl) for fungal as positive controls were tested against the pathogens. Varied volumes of compounds loaded into the wells of the Petri plates were used to assess the activity of the compounds.

Then, the plates were incubated at 37°C for 24-36 h, the zone of inhibition was measured in millimeter of the every well and the values were noted. Triplicates were maintained in all volumes, and the average values were calculated for the ultimate antimicrobial activity.

3. RESULTS AND DISCUSSION

3.1. Characterization of Copolymer

FTIR(KBr): 'D' 1671, 1446, 1729, 1151 cm^{-1}.'QD' 1670, 1440, 1289, 3434 cm^{-1}, 'V' 1681, 1443, 1330, 3053, 1557 cm^{-1}, 'NV' 1667, 1441, 1330, 3413 cm^{-1}, N^{+} H 2682 cm^{-1}, 'PV' 1667, 1441, 1328, 2961, P-Ph 1111 cm^{-1}, 1436 cm^{-1}. H1 NMR of D: (DMSO) 1.3-2.4 (5H, Me), 7.2, 7.9 (2H, Me), 3.2(1H, Me) 5.6 (1H, Me) and 6.0 (1H, Me). C_{13} NMR of D: (DMSO) 170 (C), 180 (C), 138 (C), 48 (CH_2), 24 (CH_2), 30 (CH_2), 125-130 (CH_2, $2CH_3$). H1 NMR of V: (Chloroform) 2.0 (2H, Me), 2.2 (2H, Me), 2.4 (2H, Me), 7.4 (1H, Me), 6.4 (1H, Me), 4.5 (2H, Me), 1.6-2.4 (CH2, Me). C13 NMR of V: (Chloroform) 17.5 (CH_2), 23.4 (CH_2), 30.1 (CH_2), 175.2 (C), 125.6 (CH), 144.7 (CH), 47.5 (CH2).

3.2. Antimicrobial Activity

The antimicrobial properties of the polymers and their compounds were evaluated against two Gram-positive bacterial strains, B. pumilus and S. aureus, two Gramnegative bacterial strains, E. coli and E. aerogenes. The fungal

strains used were F. oxysporum and A. Niger and Penicillium sp. by agar well diffusion method.

The inhibition zone in mm for the copolymers and its quaternized salts are given in is evident that the copolymer of NVPDMAEMA and NVP-VBC and their quaternized salts are showing a better inhibition for all microbes selected for the study. A clear zone of inhibition is not observed for phosphonium salt of copolymer V, may be due to the diffusion of salt into the agar. Quaternized salt of D is also inactive toward bacterium E. aerogenes and fungi F. oxysporum and Penicillium sp.

4. CONCLUSION

The copolymers NVP-DMAEMA and NVP-VBC were synthesized by free radical polymerization. They were quaternized by suitable reagents. All were characterized by FTIR and NMR. The antimicrobial activity of all was determined by Agar well diffusion method. A validated zone of inhibition was observed with all compounds.

Copolymer NVP-DMAEMA, NVP-VBC and quaternized salt of NVP-VBC were exhibiting a better antibacterial and antifungal property. Whereas, quaternized salt of NVP-DMAEMA was not that much antimicrobial active.

REFERENCES

1. S. Vijaysekaran, T. V. Chirila, Y. Hong, S. G. Tahija, P. D. Dalton, I. J. Constable, I. L. McAllister, (1996) Poly(I-vinyl-2-pyrrolidinone) hydrogels as vitreous substitutes: Histopathological evaluation in the animal eye, Journal of Biomaterials Science, 7: 685-696.
2. H. Ranucci, G. Spagnoli, L. Sartore, F. Bignottie, P. Ferruti, (1995) Synthesis and molecular weight characterization of end-functionalized N-vinyl2-pyrrolidone oligomers, Macromolecular Chemistry and Physics, 196: 763-774.
3. H. Y. Lee, S. A. Yu, K. H. Jeong, Y. Kim, (2007) Poly(vinyl pyrrolidone) conjugated lipid system for the hydrophobic drug delivery, Macromolecular Research, 15: 547-552.
4. B. S. S. Reddy, R. Arshady, M. George, (1985) Copoly-merization of N-vinyl-2-pyrrolidone with 2, 4, 5 - tri-chlorophenyl acrylate and with 2-hydroxyethyl methacrylate: Reactivity ratios and molecular weights, European Polymer Journal, 21: 511-515.
5. S. Morariu, C. Hulubei, (2006) Radical copoly - merization of functional N-substituted maleimides with N-vinyl-2-pyrrolidone, High Performance Polymers, 18: 185-198.
6. G. Bauduin, B. Boutevin, M. Belbachir, R. Meghabar, (1995) Determination of reactivity ratios in radical copolymerization: A comparison of methods for a methacrylate/N-vinylpyrrolidone system, Macromolecules, 28: 1750-1753.
7. S. Soundarajan, B. S. R. Reddy, (1991) Glycidyl methacrylate and N-vinyl-2-pyrrolidone copolymers: Synthesis, characterization, and reactivity ratios, Journal of Applied Polymer Science, 43: 251-258.
8. S. Vijay Kumar, T. E. Musturappa, S. Prasannakumar, K. M. Mahadevan, B. S. Sheregara, (2007) N-vinyl pyrrolidone and ethoxyethyl

methacrylate copolymer: Synthesis, characterization and reactivity ratios, Journal of Macromolecular Science, Part A, 44: 1161-1169.

9. D. Radic, L. Gargallo, (1997) Synthesis, reactivity ratios, and solution behavior of vinylpyrrolidone - Co-monoalkylitaconate and vinylpyrrolidone-co-dialkyl itaconate copolymers, Macromolecules, 30: 817-825.
10. D. Queroz, R. R. Vargas, O. Z. Higa, R. R. Ribeiro, M. Vitolo, (2002) Lactam–amide graft copolymers as novel support for enzyme immobilization, Journal of Applied Polymer Science, 84: 767-777.
11. S. K. Bajpai, J. Sonkusley, (2002) Hydrogels for oral drug delivery of peptides: Synthesis and characterization, Journal of Applied Polymer Science, 83: 1717-1729.
12. T. Beitz, J. Kotz, G. Wolf, E. Lleinpeter, S. E. Fribery, (2001) Poly(N-vinyl-2-pyrrolidone) and 1-Octyl-2-pyrrolidinone modified ionic micro emulsions, Journal of Colloid and Interface Science, 240: 581-589.
13. M. Basri, A. Harun, M. B. Ahmad, C. A. N. Razak, A. B. Salleh, (2001) Immobilization of lipase on poly(N-vinyl-2-pyrrolidone-co-styrene) hydrogel, Journal of Applied Polymer Science, 82: 1404-1409.
14. H. F. Mark, N. M. Bikales, C. G. Overberger, G. Menges, (1986) Encyclopedia of Polymer Science and Engineering, New York: Wiley Inter science.
15. N. Gatica, L. Gargallo, D. Radić, (1998) 2-Vinylpyridine-co-N-vinyl-2-pyrrolidone and 4-vinylpyridine-co-N-vinyl-2-pyrrolidone copolymers: Synthesis and reactivity ratios, Polymer International, 45: 285-290.

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CONCEPTUAL RESEARCH FOR RURAL DEVELOPMENT PROGRAMMES

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Abstract- The provincial improvement by alludes all the of the transform for enhancing those caliber for life and investment welfare for people existing clinched alongside moderately disengaged Also sparsely populated regions. Mahatma Gandhi national country vocation assurance go about (MGNREGA) may be acknowledged as a “Silver Bullet” to eradicating provincial destitution unemployment, method for generating interest to profitable Labor power for towns. It gives an elective hotspot of vocation which will have a effect around decreasing migration, confining tyke labour, alleviating poverty, and making towns supporting toward oneself through profitable possessions making for example, such that street construction, cleaning up for water tanks, dirt Also water protection work, and so on. For which it need been recognized Likewise the biggest anti-poverty programme for India. In this paper, In light of the optional data, a endeavor need been made with comprehensively comprehend the improvement exert on modify those provincial an aggregation vocation on the support from claiming Different optional information. Those provincial improvement by alludes all the of the methodology from claiming enhancing those nature from claiming an aggregation and investment welfare of people existing On moderately separated Also sparsely populated regions. Mahatma Gandhi national provincial job surety enactment (MGNREGA) may be viewed as a “Silver Bullet” to eradicating provincial destitution and unemployment, method for generating interest for profitable Labor compel On towns. It gives an elective hotspot for vocation which will need a sway once lessening migration, confining kid labour, alleviating poverty, settling on towns overseeing toward oneself through profitable benefits creation for example, street construction, cleaning up about water tanks, soil water protection work, and so forth. For which it need been acknowledged concerning illustration the biggest anti-poverty programme previously, India. In this paper, dependent upon those optional data, a endeavor need been made to comprehensively get it the improvement exertion with modify the country existence vocation on the foundation for Different optional information.

Keywords: Rural development; Employment Guarantee Act; self-sustaining; Development projects.

1. INTRODUCTION

For India, out about aggregate populace of 121 crores, 83. 3 crores live in rustic regions (Census of India, 2011). Thus, About 70 percentage of the India's populace exists for rustic regions. These country populaces camwood a chance to be portrayed impostor poverty, low levels about ability Also income, large amount about unemployment, also poor sustenance also wellbeing status. In place on tackle these particular problems, an number for country advancement programmes would continuously executed with make chances for change of the caliber from claiming life of these provincial kin those haul country advancement will be the in general improvement for rustic regions on move forward those nature of existence from claiming country individuals. Also it is a transform prompting manageable change in the caliber of term of provincial people, particularly poor people (Ramesh, 2012). The provincial developmental programmes proposed to decrease those destitution unemployment, to move forward the wellbeing instructive status will satisfy the essential necessities for example, food, sanctuary clothes of the country populace. Should enhance those states of provincial people, legislature from claiming india propelled A percentage schemes through those arranging requisition for india for example, such that mahatma Gandhi national country employment assurance enactment (MGNREGA), Rastriya Sama Vikas Yojana (RSVY), Indira Was Yojana (IAY), Sampoorna Grameen Rozgar Yojana (SGRY), coordinated circuit tribal improvement undertaking (ITDP), Pradhan Mantri Gram Sadak Yojana (PMGSY), coordinated youngster advancement administrations (ICDS), improvement of ladies kids done rustic regions (DWCRA), and so on. Constantly on these schemes would meant to decrease those hole between country Also urban people, which might assistance decrease irregular characteristics and accelerate those improvement methodology.

2. MGNREGA: THE HISTORICAL OVERVIEW

In the post-Independence period, the Government wanted to uplift the socio- economic condition (SEC) of their people who mainly depended upon forest products and daily labour. Another important component of the governmental perspective was to settle the rural population as agriculture population. The Mahatma Gandhi National Rural Employment Guarantee Act, 2005, guarantees 100 days of employment in a financial year to any rural household whose adult members are willing to do unskilled manual work. The Act has come into force with effect

from February, 2006 in 200 districts initially and later on, it was extended to all the rural districts of India from the financial year 2008-09.

MGNREGA has come after almost 56 years of experience of other rural employment programmes, which include both Centrally Sponsored Schemes and those launched by State Governments. These comprise the National Rural Employment Programme (NREP) 1980-89; Rural Landless Employment Guarantee Programme (RLEGP) 1983-89; Jawahar Rojgar Yojana (JRY) 1989-1990; Employment Assurance Scheme (EAS) 1993-99. Jawahar Gram Samridhi Yojana (JGSY) 1999-2002; Sampoorna Grameen Rojgar Yojana (SGRY) 2001; National Food for Work Programme (NFFWP) 2004. Among these programmes, the SGRY and NFFWP have been merged with NREGA in 2005.

The act might have been executed in phased way – 130 areas were included on 2007–08. For its spread over 625 regions crosswise over the country, the lead system of the UPA legislature need the possibility to expand those obtaining force of those provincial poor, decrease trouble relocation and should make handy benefits on provincial India. Also, it might cultivate social Also sex balance similarly as 23 percentage specialists under the plan need aid booked Castes, 17 % planned Tribes 50 percentage ladies. Over 2010–11, 41 million families were utilized once NREGA worksites. This enactment might have been presented with an point of enhancing those buying force of those provincial people, essential semi alternately incompetent fill in on people existing clinched alongside provincial India, if alternately not they are The following those neediness offering (en. Wikipedia.Org./ Mahatma_Gandhi_National_Rural_ Employment).

3. THE PRESENT STUDY

In the present study, the investigator investigated the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in detail with the help of secondary data. The data was collected between May 2013 to December 2013 from Barkatullah university library, daily newspapers, magazines and internet. Two case studies are also cited based on first-hand field work. The present study intends to assess the overall scenario i.e., the pros and cons associated with the scheme with the following objectives:

1. To assess and acquire new insights on development of MGNREGA as well as overall socio-economic impact of different rural development programmes on the lives of the rural people.

2. To document the improvement or changes brought by MGNREGA in the lives of the rural poor at the household level and village level.

4. MGNREGA: THE PRESENT STATUS

A number of authors have attempted to study the MGNREGA in detail and its related problems.

Dreze (2007) takes a gander in the debasement done country occupation programmes done Orissa (India) entryway this need begun and Johnson had proceeded over an NREGA also. As stated by Mathur (2007), an arrangement for general Also nonstop stream of legitimate data may be essential, concerning illustration contradicted of the irregular reports investigations reliant on the activity about people and Assemblies. With enhance implementation; the administration needs should tackle problems, change arrangement directives, and issue operational rules to the district, square town levels. Those legislature must make those lead, be proactive, activate foundations and groups, Also utilize the networking viably. NREGS includes a few lakhs of administration officials, panchayat functionaries, chosen representatives, Ngos and Group Assemblies. They assume a basic role, be that required little preparation to those challenge.

NREGS indeed may be a project of national criticalness which need been minimized. Same time the service of provincial advancement will be the nodal service toward the center, each pertinent Branch Also ever-enduring obliges constantly included. Ambasta et al. (2008) provided for a number of significant proposals. These incorporated sending from claiming full-time experts committed to MGNREGA in the least levels, particularly in that square level. Escalated consideration endeavors toward fabricating up an enormous unit of fully prepared grass-root laborers are obliged at those Gram panchayat level through an across the country development to ability building, captivating administration and non-government preparation foundations.

Rural development is the need of the hour. It not only constitutes the development of rural regions but also aims at improving the well-being and quality of life to the rural poor through collective process. It is clear from the review that though this programme is meant for improving the life conditions of the people in the rural settings but this programme suffers from a number of shortcomings. Thus, the detailed review of literature clearly indicates that there is a need for extensive anthropological research

work for understanding the socio-economic impact of MGNREGA programme on rural Indian.

5. OBSERVATIONS FROM THE FIELD

The following case studies are cited based on first-hand field work conducted at Machhar Khani village of Jaipur district in Rajasthan, India and Babachiya village of district in Bhopal, Madhya Pradesh India.

Case 1: Name: Saima begum Age: 43 She exists Previously, Machhar Khani town of Jaipur region. She is a widow need an child who investigations in the XIIth standard. She says that Agricola worth of effort is accessible best for around 6 months clinched alongside An quite a while than a really not ceaselessly. A portion of the fill in like collecting paddy may be carried by couples (husband wife together) she will be not capable on try to such worth of effort since she is a widow. She then again has the ability will worth of effort under NREGA. She need acted for 30 times to 2007-2008 Also need utilized those wage she earned on backing her son's instruction. She is euphoric that NREGA compensation need aid paid consistently might want with get An card to her child something like that that he excessively awful could worth of effort.

Case 2: Name: Neha Kumari Age: 37 She lives in Babachiya village of district in Bhopal. She has BPL card and her family used to stay in a kacca house. Recently she and her husband built a brick house for them. She came to know about the provisions under the NREGA through a public announcement in the village. She decided to work under NREGA. Last year she and her husband worked under NREGA for 100 days and earned a good amount of money at the rate of Rs. 60/- per day. As the small amount of land they have is enough to fulfill their basic food necessities. Finally, they decided to spend money earned by NREGA to build a pacca house for them. Thus, it is clear from the cited cases that MGNREGA is a very important rural development programme in India as it helps the rural poor to earn their livelihood. This programme can go in a long way to improve the socio-economic status of the rural poor.

6. CONCLUSION

Around 70 per cent of the Indian population is living in rural areas. People in rural areas should have same QOL as is enjoyed by people living in sub-urban and urban areas. , the cascading effects of poverty, unemployment, poor and inadequate infrastructure in rural areas on urban centers is leading to socio-economic tensions manifesting in economic deprivation and urban poverty.

Mahatma Gandhi national provincial work assurance

demonstration (MGNREGA) is viewed as Likewise An "Silver Bullet" for eradicating provincial neediness unemployment, by method for generating interest to profitable Labor compel to Indian towns. It gives a elective sourball for vocation which will need an sway with respect to diminishing migration, confining kid labour, alleviating poverty, and settling on towns self- manage through profitable holdings making for example, way construction, cleaning dependent upon about water tanks, soil water protection work, and so forth throughout this way, observing and stock arrangement of all instrumentation may be echo. For which it need been acknowledged concerning illustration the biggest anti-poverty programme in the planet. Since the plan will be setting off to make set up for an undefined time about time, is, no doubt extended As far as extension geological coverage, there need aid huge numbers tests like non- homogeneity On its effectiveness, district particular disparities Also results and so forth throughout this way, observing and stock arrangement of all instrumentation may be echo.

It will be precisely because of this reason; few Ngos have officially carried exactly surveys. However, they are low recurrence restricted with particular case alternately two districts, additional vitally cantered around systemic defects, as opposed testing the sway about their programmes once beneficiaries. There may be a need should do an in- profundity survey of these country improvement programmes for two separate methodologies i. e,

(i) All India studies by capturing signals from all corners of the country, taking into account all the regions, and

(ii) Comprehensive coverage of all the objectives and clauses preserved in the MGNREGA in a broad manner. Thus, there is also a need to critically examine the implementation process of this programme and its impact on livelihood of the rural people. It can be concluded that the success of this Act depends upon its proper implementation and in this scenario, the community participation is very important to make this programme more effective.

REFERENCES

1. Ambasta, P., Shankar, P.S.V., & Shah, M. (2008). Two years of MGNREGA: The road ahead. Economic and Political Weekly, February 2008.
2. Dey, S., & Bedi, A. (2010). The National Rural Employment Guarantee Scheme in Birbhum. Economic and Political Weekly, XLV (41), 19-25.
3. Dreze J. (2007). MGNREGA: Dismantling the contractor raj. The Hindu, 20th November, 2007.

4. Khera, R. (2008). Empowerment Guarantee Act. Economic and Political Weekly, August 2008.
5. Mathur L. (2007). Employment guarantee: Progress so far. Economic and Political Weekly, December 2007.
6. Mathur, L. (2009). Silent but successful initiative. The Hindu, 1st March, 2009.
7. Mehrotra, S. (2008). NREG two years on: Where do we go from here? Economic and Political Weekly, August 2008.
8. Roy, D. S., & Samanta, D. (2010). Good Governance and Employment Generation through NREGA: A case study of Gram Panchayat in West Bengal. Presented at Conference on "Infrastructure, Finance and Governance: Push for Growth, Organized by Ministry of Rural Development, GOI.
9. Shah, M. (2004). National Rural Employment Guarantee Act: A Historic opportunity. Economic and Political Weekly, XXX (39), 5287-5291.

WEB REFERENCES

1. http://www.nrega.ac.in
2. http://www.gov.in
3. http://www.nrega.net
4. http://www.nrega.nic.in/guidelines.htm.

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AN ANALYTICAL RESEARCH ON NANOSIZED CUO INCORPORATED HYDROXYPROPYL-METHYLCELLULOSE POLYMER FILMS

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Abstract:- Addition of metal-oxide nano-particles (NPs) to polymers allows the modification of physical properties of polymers as well as the implementation of new features in the polymer matrix. In this work, we have made an attempt to disperse CuO NPs in the hydroxypropyl methylcellulose (HPMC) and to understand the changes in structural, optical and thermal properties of the polymer films. CuO NPs were added in four different concentrations, viz., 0.1, 0.2, 0.3 and 0.4 wt.%. A total of five films were prepared (including the pure HPMC film, for comparison). The prepared films were subjected to X-ray diffract meter, scanning electron microscope, Fourier transform infrared, differential scanning calorimeter, and ultraviolet-visible spectral analyses. The obtained results are reported.
Keywords: Polymer nano-composite films, Metal-oxide nano-particles, Structural properties.

1. INTRODUCTION

Fabrication of polymer nano-composites, with metal-oxide nano-particles (NPs) dispersed in the polymer matrix has paying much attention, recently as advanced technological materials. Because the combination of metal-oxide NPs and a polymer offers simple processing steps, low cost and can be integrating the promising properties of both components [1].

It is well known that the addition of nano-sized inorganic particles into the polymeric matrices, the new composite material will show changed – mechanical, thermal, optical, and effective bactericidal function - which is very much differ from those of conventional materials [2].

By suitable doping, the properties of polymers can be improved to a desired limit [3]. We have investigated the effect of the addition of CuO NPs on the mechanical, thermal, optical and structural properties of hydroxy propyl methylcellulose (HPMC) polymer films. Hence, in this paper, we have reported tensile strength (TS), elongation break (E in %), and Young's modulus (Y), thermal transitions, optical band

gap and morphological studies of HPMC polymer films with and without incorporated of CuO NPs at different concentrations.

2. EXPERIMENTAL

2.1. Synthesis of CuO Nano-powder

An analytical grade of cupric sulfate pent hydrate ($CuSO_4 \cdot 5H_2O$) and sodium hydroxide (NaOH) were purchased and used as precursors and stabilizing agent respectively. Double distilled water was used as solvent throughout the experiment. In a typical reaction, a mixture of 0.5 M sodium hydroxide and 0.1 M of copper sulfate aqueous solution is prepared in the ratio of 1:3 and stirred for 15 min.

The resulting solution is kept in a domestic microwave oven (operated with frequency 2.45 GHz and power 800 W) for 10 min. The obtained colloidal precipitate was separated by centrifugation, washed with distilled water and absolute ethanol several times. In the end, acetone washing is used to remove the organic impurities and then dried at 40°C for 24 h.

2.2. Preparation of HPMC/CuO Nano-composite Films

To study the effect of prepared CuO nano-materials on properties of HPMC polymer, HPMC/CuO nano-composites were prepared with five different percentage (i.e., 0.1, 0.2, 0.3, and 0.4) weights of CuO in the 5% - HPMC matrix film. This was denoted as HC1, HC2, HC3, and HC4, respectively.

Where, H stands for HPMC (with average molecular weight approximately 25,000 Daltons) and C1 to C4 indicates CuO nano-materials of different % weight. The prepared films were free from air bubbles. Thicknesses of the produced films were in the range of 0.09-0.21 mm and they were cut into pieces suitable for measurements. The thicknesses of the films were measured by Mitutoyo instrument, Model (2050F) made in Japan.

3. RESULTS AND DISCUSSIONS

3.1. X-ray Diffraction (XRD) Analysis

The XRD measurements were performed to examine the nano-structured feature and crystalline of pure CuO, neat HPMC, and HPMC-CuO polymer nano-composites. The crystalline nature of pure nano-CuO was observed by various sharp peaks shown by XRD patterns in Figure 1. XRD of HPMC/CuO NP nano-composite films are given in Figure 2.

For the pure HPMC, the main diffraction peak was observed at 2θ =20.88°, which represents its partial crystalline structure [4]. From figure 1, it was clear that the synthesized CuO showed the main characteristic peaks, which are sharper and stronger at 2θ=35.4° and 38.6° confirming the monoclinic structure of CuO NPs as reported earlier [5]. 10 distinct

diffraction peaks can be seen at the 2θ values of 32.77, 35.41, 38.61, 48.66, 53.34, 58.13, 61.43, 67.90, 72.23 and 75.04 for the nano-sized crystalline structure of CuO

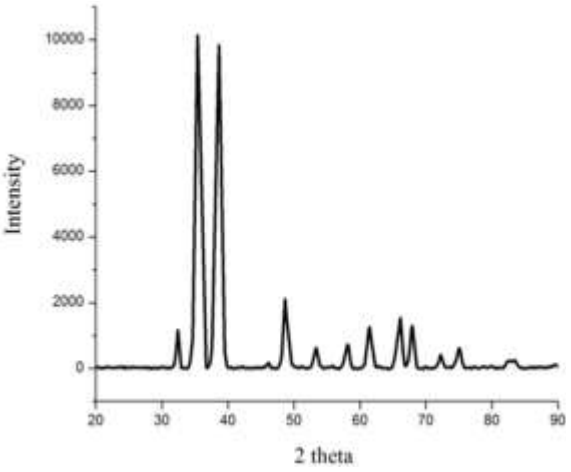

Figure 1 Powder X-ray diffraction spectrum for pure CuO nano particles.

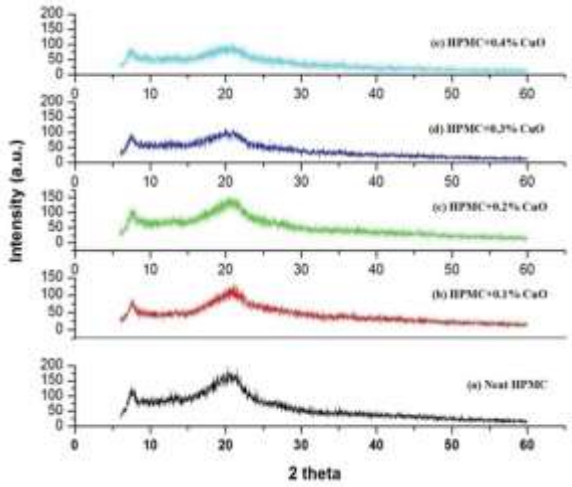

Figure 2 X-ray diffraction scans of hydroxypropyl methylcellulose/CuO nano composite films.

and the values were found to be in good agreement with literature values (JCPDS file no. 45-0937) [5]. XRD patterns of pure HPMC and HPMC-CuO nano-composites having 0.1, 0.2, 0.3 and 0.4 wt.% of CuO. The crystalline nature of HPMC results from the strong intermolecular interaction between HPMC polymer networks. XRD profiles of the composites showed slight shifting or broadening of peak at 2θ = 20.88°.

The intensity of HPMC-CuO nano-composite peaks decreases with increase in nano-filler concentration. This is because the interactions between HPMC and nano-CuO lead to the decrease in the intermolecular interaction between HPMC chains, thereby leading to the grain size of the nano-composite decreases with higher the percentage of NPs inclusion [6].

However, in this case, there was unusual increase in crystalline size to some extent and decrease at 0.4wt%. The crystallite size (dXRD) of HPMC/CuO nano-composite measurement could be carried out using the Scherer equation.

3.2. Fourier Transform Infrared (FTIR) Analysis

The prepared CuO nano-materials were examined by FTIR analysis and are shown in Figure 3. There are two absorbance bands which appear at around 650 and 3600-3100 cm−1. Sharp absorption band at 650 cm−1 is associated with Cu-O stretching mode. A broad band in the range of 3600-3100 cm−1 is

Table 1 Crystallite size of HPMC/CuO Nano composites

Sample	2 θ	FWHM	Crystallite size-D (Å)
Pure	20.882	4.522	18.66
HC-1	20.841	4.875	17.3
HC-2	21.034	4.508	18.72
HC-3	20.884	4.438	19.01
HC-4	20.505	5.296	15.92

HPMC=Hydroxypropyl methylcellulose

due to the stretching in water molecules associated with CuO. The result suggests the presence of Cu-O bonds and some constitutional water is incorporated in the copper oxide structure. Thus, the formation of copper oxide is confirmed from the FTIR study.

In Figure 3, the sample shows that peaks at 3441-3439 cm^{-1} are due to OH stretching vibration and intermolecular H-bonding [8]. The peak at 2918 cm^{-1} is attributed to stretching vibration of –CH, and band at 1645 cm^{-1} indicates the presence of stretching vibration of six-membered cyclic rings. The band at 1055 cm^{-1} is for stretching vibration of –C–O groups. The peak at 945 cm^{-1} is due to the pyranose ring [9].

3.3. Structural Studies

Figure 5 shows the scanning electron microscope (SEM) image of the prepared CuO NPs. The size and morphology of CuO NPs have been examined by SEM. It shows that the CuO NPs are in feather shape. SEM micrographs clearly show the surface features, by which it highlights that CuO NP was successfully prepared and it can be seen that the particles congregate together and the size of which is within 50 nm.

3.4. Mechanical Properties

The effects of NPs on mechanical properties of the HPMC/CuO nano-composite films were evaluated up to their failure. We have calculated TS, Young's modulus and elongation at break (%) of HPMC/CuO NP nano-composites by stress–strain curves and enlisted in Table 2. There were unusual changes in the TS and modulus of the nano-composites has been experienced as higher the dosage of CuO.

Furthermore from Table 2, we observed that percentage elongation at break (E) increases with the increase in the percentage of NPs at certain extent and gradual decrease often at 0.3 wt% of nano material inclusion. A possible explanation for this result will be, TS of the all composite film was increased compared with the neat matrix due to the reinforcing effect of NPs. As the percentage raise of nano-filler inclusion, the stiffness in polymer chain decreases and the NPs itself acts as a plasticizer.

3.5. Thermal Properties

Differential scanning calorimeter (DSC) is an analytical technique used to determine a material's

thermal stability and glass transition temperature (Tg) by monitoring the heat flow that occurs as a sample is heated. DSC thermo-grams of HPMC/CuO nano composite films. Thermal behavior of parent HPMC and HPMC/CuO nano-composite films were studied by DSC analysis.

The derivative of the DSC thermo-grams, rate of thermal transitions was also plotted against temperature as shown in the DSC graph, it was found that two temperature regions can be identified over which the thermal transitions occur. In the present system, DSC thermo-gram shows the overlap of glass transition temperature. In the present investigation, DSC thermo-gram of HPMC and HPMC/CuO nano-composite films show two endothermic peaks which are interpreted as glass transition temperature (Tg) and melting temperature (Tm).

The glass transition temperature of HPMC is shifted to higher temperature from 53.33°C for pristine HPMC to 60.26°C by the progressive addition of CuO in the nano-composite films.

4. CONCLUSIONS

We observe that there are changes observed by incorporation of NPs have significant influence on structural, mechanical, optical and thermal properties in HPMC polymer matrix. From XRD study of CuO incorporated HPMC films, it has been found that there are much changes in the intensity of the X-ray reflections.

The significant change in structural parameters in the polymer is due to the random dispersion of NPs in the matrix of HPMC, lowers the short-range interaction between the layers of HPMC, leading to increase in disorder in the lattice.

There were unusual differences in TS, Young's modulus and percentage elongation at break, and increases as the CuO concentration increases up to certain extent compare to pure matrix. We have also examined the reasons for such changes in terms of weakening of intermolecular interactions (Vander Waal's forces) often 2-3% loading. The doping of NPs also improves the thermal stability of films and optical band gap.

REFERENCES

1. J. Pyun, K. Matyjaszewski, (2001) Synthesis of nanocomposite organic/inorganic hybrid materials using controlled/"living" radical polymerization, Chemistry of Materials, 13(10): 3436-3448.
2. W. A. Goddard, D. W. Brenner, S. E. Lyshevski, G. J. Lafrate, (2003) Handbook of Nano science Engineering and Technology, London, UK: CRC Press.
3. P. W. M. Blom, H. F. M. Schoo, M. Matters, (2003) Enhancement in electrical and thermal properties of ethylene vinyl acetate co- polymer by ZnO nano particles, Applied Physics Letters, 73: 6988-6991.

4. Y. Sangappa, T. Demappa, D. Mahadevaih, S. Ganesh, S. Divakar, M. Pattabi, R. Somashekar, (2008) Physical and thermal properties of 8MeV electron beam irradiated HPMC polymer films, Nuclear Instruments and Methods B. 266(18): 3975-3980.
5. D.P. Volanti, D. Keson, L.S. Cavalcanate, A.Z. Simoes, M.R. Joya, E. Longo, J.A. Varela, P.S. Pizani, A.G. Souza, (2008) Synthesis and characterization of CuO flower-nano structure processing by a domestic hydrothermal microwave, Journal of Alloys and Compounds, 459(1): 537-542.
6. J. K. Rao1, A. Raizada, D. Ganguly, M. M. Mankad, S. V. Satayanarayana, G. M. Madhu, (2015) Investigation of structural and electrical properties of novel CuO–PVA nano composite films, Journal of Materials Science, 50: 7064-7074.
7. T. M. Wu, J. C. Cheng, M. C. Yan, (2003) Crystallization and thermoelectric behaviour of conductive filler filled poly (e-caprolactone)/poly(vinylbutyral)/montmorillonite nano composites, Polymer – Journal, 44(8): 2553-2562.
8. G. Torrado, S. Fraile, S. Torrado, S. Torrado, (1998) Process-induced crystallite size and dissolution changes elucidated by a variety of analytical methods, International Journal of Pharmaceutics, 16(1): 55-63.
9. R. M. Silverstein, F. X. Webster, (2002) Spectrometric Identification of Compounds, New York: Wiley.

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AN APPLICATION AND RESEARCH REVIEW FOR DIFFUSIVE SPATIO-TEMPORAL NOISE IN A FIRST-PASSAGE TIME MODEL

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Abstract- The intracellular release of calcium from the endoplasmic reticulum is controlled by ion channels. The resulting calcium signals exhibit a rich spatio-temporal signature, which originates at least partly from microscopic fluctuations. While stochasticity in the gating transition of ion channels has been incorporated into many models, the distribution of calcium is usually described by deterministic reaction-diffusion equations and the validity of the latter modeling approach has not been questioned. Here this issue is addressed by using two different models to calculate the frequency of localized calcium signals (calcium puffs) from IP3 receptor channels. Predicting the puff frequency is a central task of a calcium dynamics model and allows immediate comparison to experimental studies. The complexity of the full calcium system is here limited to the basic opening mechanism of the ion channels and, in the mathematical reduction simplifies to the calculation of a first passage time. Two models are then studied: (i) a hybrid model, where channel gating is treated stochastically, while calcium concentration is deterministic; and (ii) a fully stochastic model with noisy channel gating and Brownian calcium ion motion. The second model utilises the recently developed two-regime method[1] in order to simulate a large domain with precision required only near the Ca^{2+} absorbing channels. The expected time for a first channel opening that results in a calcium puff event is calculated.

Keywords: Ion channel gating, Calcium puffs, Two-regime method.

I. INTRODUCTION

The dynamics of intracellular Ca^{2+} is a major determinant of many cell signaling processes[2]. In order to address a host of different target processes, cells orchestrate the elevation of Ca^{2+} concentration by a complex machinery of Ca^{2+} transport and binding. Early modeling approaches considered deterministic equations based on macroscopic rate equations. Later on, it was found that release of Ca^{2+} from the endoplasmic reticulum (ER) can occur in a localized and highly random manner[5], thus rendering the

deterministic modeling approach for Ca^{2+} dynamics incomplete. In many cell types, release of Ca^{2+} from the ER occurs through inositol 1,4,5-trisphosphate receptor (IP3R) channels in the ER's membrane. The receptors regulate Ca^{2+} transport in response to changes of IP3 and Ca^{2+} concentration mediated by binding sites on the cytosolic side of the ER's membrane[6]. While increases in the concentration of the second messenger IP3 generally promote release, the dependence on cytosolic Ca^{2+} concentration is biphasic and mediated by two types of binding sites. Small increases in Ca^{2+} concentration compared to rest level concentrations increase the open probability of IP3R channels. The stimulation Ca^{2+} binding gives rise to a self-amplifying mechanism called Ca^{2+} induced Ca^{2+} release (CICR): Ca^{2+} released by one or several channels diffuses in the cytosol and increases the open probability of neighbouring channels by binding to their stimulatory binding sites. As the level of Ca^{2+} rises further, inhibitory binding of Ca^{2+} dominates. Consequently, the open probability decreases significantly as Ca^{2+} levels reach large values. Taken together, activating and inhibiting binding processes in combination with Ca^{2+} diffusion allow for a commonly accepted model for cooperative openings and closings of receptor channels[7].

Elevations of Ca^{2+} concentrations appear either as quasi-deterministic waves or as localized events over spatial distances on the order of a micrometer[7]. In many cells, IP3R channels are distributed in clusters on the ER's membrane. It is often found that CICR synchronizes channels within clusters, resulting in events that were identified with the localized patterns often called puffs[8]. In this regime, Ca^{2+} release does not spread to neighbouring clusters, which are typically separated by a few micrometers. Recent studies emphasize the role of sub-cellular Ca^{2+} rises for physiological function[9–11].

In this paper, we show that stochastic effects (taken into account by the detailed modeling of discrete calcium ions and their Brownian motion) has consequences for the Ca^{2+} dynamics. Simulation of the detailed stochastic model is enabled by a recently developed multiscale approach1 which is summarized in the Methods section. We specifically study Ca^{2+} puffs and the period of their appearance. Puffs have taken a central role in the modeling of intracellular Ca^{2+} dynamics, since an integrative model of local and global release should incorporate Ca^{2+} puffs as elementary building blocks of global waves and oscillations. In this paper, we show that the noise contributes to a

decrease in interpuff times. The paper is divided into Sections II (Methods), III (Results) and IV (Discussion). In the following Section II, we summarize both the mean-field model and the computational method used to simulate the detailed stochastic model.

II. THEORY AND SIMULATION METHODS

To simplify our analysis we neglect the binding and unbinding of IP3 as well as the binding to inhibitory binding sites. We consider IP3R channels releasing Ca2+ from the ER to the cytosol to consist of K = 4 identical subunits with each subunit carrying a binding site that together assume the activating role for the channel. The apparent cooperativity in Ca^{2+} binding requires a minimum number N of calcium ions to be bound for opening of the channels. Although N = 3 is traditionally used in modelling4, we will also discuss consequences of different values of $N \in \{1, 2, \ldots, K\}$. We will study how much time passes until the number of activated subunits reaches N for any of the cluster's channels, given a suitable initial condition on the state of all four binding sites. This first passage time can be regarded as a realistic approximation of the real interpuff interval (IPI) since it has been suggested that opening of any channel in the cluster triggers a puff. Although we do not simulate the inhibitory dynamics explicitly, we still take it into account into the initial state to which the channel is reset after each puff. Specifically, we let the number of activated subunits equilibrate to a distribution, constrained by the requirement that the channel is closed (i.e. the number of activated subunits is less than N) but otherwise allowing for all possible numbers of activated subunits to occur.

Mean-field non-spatial model and its analysis

Calcium channels from the ER to the cytosol are usually arranged in closely packed clusters consisting of up to 10 channels. Here we denote the number of channels as C and use C = 9 unless otherwise stated. Each channel has K = 4 subunits. We assume that IP3 concentrations are large. We submit, therefore, that the channel opens and releases Ca2+ in the form of a puff if at least N = 3 of the four subunits are activated on a single channel in the cluster. A subunit is activated when a Ca2+ ion is bound to it. The Ca2+ ions are also permitted to dissociate themselves from a subunit and thereby deactivating it. This chemical reaction is given by

$$Ca^{2+} + \text{inactive subunit} \underset{k_2}{\overset{k_1}{\rightleftarrows}} \text{active subunit} \qquad (1)$$

III. RESULTS

Let us define *fMC(τ), fTRM(τ)* and *fT (τ)* to represent the probability distribution for the interpuff time that is derived from MC simulations, TRM simulations and the theoretical result given in formulae (8)–(9), respectively, for C = 9. We will implement the $\bar{f}$ notation to indicate the case C = 1. In Figure 1, we plot the distributions $\bar{f}$ *MC*(τ),$\bar{f}$ *fTRM(τ)* and $\bar{f}$ T (τ).

Distributions $\bar{f}$ *MC*(τ) and $\bar{f}$ *TRM*(τ) were determined using the ksdensity function in Matlab's statistics toolbox. The ksdensity function computes a probability

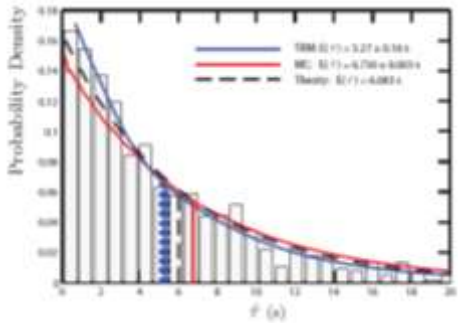

FIG. 1. *Probability distributions and means for the interpuff time for* C = 1 *given by theoretical estimates* $\bar{f}$ *T* ($\bar{\tau}$) *(black dashed line),* 10^6 *MC simulations* $\bar{f}$ MC($\bar{\tau}$) *(red solid line) and* 10^3 *TRM simulations* $\bar{f}$TRM($\bar{\tau}$) *(blue solid line). The error expected by the lack of TRM simulation data is indicated by the histogram showing actual simulated probabilities over intervals of time and blue dashed lines indicating the subsequent standard error in the mean. Parameters used:* N = 3, k_1 = 100 (μM s)$^{-1}$, k_2 = 20 s^{-1}, c_0 = 0.02 μM *and* D = 220 μm2s^{-1} *(for TRM simulations only).*

IV. DISCUSSION

In this paper we have tested a basic assumption of many studies on Ca^{2+} signaling, which is that the Ca^{2+} concentration, locally or globally defined, can be regarded as a deterministic quantity. We have asked whether the properties of collective release from channels change if Ca^{2+} ions are treated as discrete entities with Brownian motion trajectories. We have found that the time intervals between stochastically occurring Ca^{2+} puffs decrease by about 20 %. This result is obtained under standard assumptions on the gating dynamics of an IP3R channel and diffusion constant D = 220 μm2s^{-1}.

The interpuff interval is here interpreted as a waiting time for a first-channel opening. The real IPI depends on other properties as well such as the refractory period after the termination of a puff. Those refractory periods have been studied recently and were found to be rather small.

Our results have clarified, that the effect of diffusive noise does not explain directly the deviations of non-spatial MC modeling and experiments. On the contrary, incorporation of discrete Ca^{2+} ions increases the deviation for large diffusion constant and makes the search for a possible mechanism explaining the disparities more urgent. For small

diffusion constant, however, the interval increases strongly compared to the non-spatial result. It is interesting to note that a small Ca^{2+} diffusion constant may be obtained in cells with large concentrations of Ca^{2+} binding proteins. Here, binding of Ca^{2+} ions to the proteins reduces the effective Ca^{2+} diffusion constant in deterministic reaction-diffusion equations and it remains to be studied if our result for small diffusion constant is relevant in this context. Our results clearly contrast earlier studies that neglect noise from calcium ion discreteness. While many authors simply assume that such deterministic modeling is valid, there is also evidence from numerical simulations. Hake and Lines, for instance, have concluded that Ca^{2+} dynamics in small cellular compartments is well described by deterministic Ca2+ diffusion and stochastic binding to receptors. Our problem differs from the setup analyzed by Hake and Lines since we consider a larger, practically cell-wide domain. A second, perhaps more significant difference to their study is that we consider a more complex channel gating model, i.e., we determine the waiting times until several ions have bound to the channel. Therefore, and although we here analyzed a strongly simplified model for calcium puffs, our result casts serious doubt on the usefulness of deterministic Ca^{2+} equations for more complex dynamical models of calcium signals.

REFERENCE

1. M. B. Flegg, S. J. Chapman, and R. Erban, “The two-regime method for optimizing stochastic reaction-diffusion simulations,” J R Soc Interface 9, 859–868 (2012)
2. B. Alberts, A. Johnson, J. Lewis, M. Raff, K. Roberts, and P. Walter, Molecular Biology of the Cell (Garland Science, New York, 2007)
3. A. Goldbeter, G. Dupont, and M. J. Berridge, “Minimal model for signal-induced Ca2+ oscillations and for their frequency encoding through protein phosphorylation,” Proc Natl Acad Sci USA 87, 1461–1465 (1990)
4. G. DeYoung and J. Keizer, “A single-pool inositol 1,4,5- trisphosphate-receptor-based model for agonist-stimulated oscillations in Ca2+ concentration,” Proc Natl Acad Sci USA 89, 9895–9899 (1992)
5. J. Yao, J. Choi, and I. Parker, “Quantal puffs of intracellular Ca2+ evoked by inositol trisphosphate in xenopus oocytes,” J Physiol 482, 533 (1995)
6. J. Foskett, C.White, K. Cheung, and D. J. Mak, “Trisphosphate receptor Ca2+ release channels,” Physiol Rev 87, 593 (2007)
7. G. Dupont, L. Combettes, and L. Leybaert, “Calcium dynamics: spatio-temporal organization from the subcellular to the organ level,” Int Rev Cyt 261, 193–245 (2007)
8. I. Smith and I. Parker, “Imaging the quantal substructure of single ip3r channel activity during Ca2+ puffs in intact mammalian cells,” Proc Natl Acad Sci USA 106, 6404 (2009)
9. C. Wei, X. Wang, M. Chen, K. Ouyang, L. Song, and et al, “Calcium flickers steer cell migration,” Nature 457, 901–905 (2008)

10. J. D. Capite, S. Ng, and A. Parekh, "Decoding of cytoplasmic Ca2+ oscillations through the spatial signature drives gene expression," Current Biology 19, 853–858 (2009)
11. A. Parekh, "Decoding cytosolic Ca2+ oscillations," Trends in Biochemical Sciences 36, 78 (2010)

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CONCEPTUAL RESEARCH BASED ON POLY (VINYL PYRROLIDON)-COBALT(II) COMPLEXES: A STUDY

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Abstract- The biological and industrial importance of many transition metals like iron, cobalt, copper etc., has been well studied. However, the attempts to employ inorganic salts of these metals in medical practice were not successful as most of them are highly toxic. In such cases Polymer-Metal Complexes can be used as substitutes both for addition and removal of metal ions into and out of a system. The use of water soluble polymer like poly (vinyl pyrrolidone), as a ligand, broadens the applications of these complexes. Polymer-metal complexes of poly (vinyl pyrrolidone) and cobalt were prepared by using aqueous solution of PVP (30K) and alcoholic solution of cobalt chloride hexahydrate (CoCl2· 6H2O) at room temperature with different molar compositions. The polymer-metal complexes were obtained in crystalline form by evaporation of the solvent. They were characterized by FTIR, 1H -NMR with DMSO as solvent and 13C - NMR. Procedure was repeated with aqueous solution of the salt also. The extent of complex formation was predicted by comparing the spectral data of the complexes with that of pure poly (vinyl pyrrolidone). The conditions for better complexation were optimized.

Keywords:- Poly (vinyl pyrrolidone), Cobalt chloride hexahydrate, FTIR, 1H-NMR, 13C-NMR.

1. INTRODUCTION

Metal ions can bind to neutral or weakly charged water soluble polymers. A polymer-metal complex is a metal complex containing a polymer ligand. Such complexes show a specific structure in which central metal ions are surrounded by a gigantic polymer chain. Polymer-metal complexes have interesting and important characteristics, especially catalytic activities, which are different from that of the corresponding ordinary metal complexes of low molecular weight.

Metal complexes are generally of two types - Werner type and non-Werner type. Non-Werner type complexes are also called organ metallic compounds which contain carbon-metal (C-M) bonding. Most of the polymer-

metal complexes studied so far belong to Werner type.

But those of non-Werner type are more attractive to chemists because of their specific catalytic activities. In recent years the study of polymer-metal complexes has been of great interest to chemists as they serve as excellent models for metalloenzymes [4,5]. They also lead to the development of highly efficient catalysts.

These complexes are the basis for the synthesis of wide range of biomedical preparations and drugs. Variations in the properties of complexes of the polymer, poly (vinyl pyrrolidone) abbreviated as (PVP), with different metal ions were studied and the optimum conditions, under which the desired properties are exhibited, are analyzed. PVP is non-toxic, water soluble, biologically compatible [11, 12] and hence it is eco-friendly [13, 14].

It is also resistant to thermal degradation in solution and relatively inert towards action of acids and bases. With poly (vinyl pyrrolidone) (PVP) as ligand, it is easy to achieve the desired success as it exhibits unique combination properties and high capacity for complex formation.

2. EXPERIMENTAL

2.1. Materials

Poly (vinyl pyrrolidone) sample of molecular mass 30K with molecular formula (C6H9NO)n and cobalt (II) chloride hexahydrate ($CoCl_2 \cdot 6H_2O$, Molecular mass=238) were used for the synthesis of complexes. Double distilled water is used for the synthesis. The reactants and other solvent (i.e., absolute alcohol) used were of AR grade and of SD Fine Chemicals. The chemicals were used directly without further purification.

2.2. Method

PVP-cobalt complexes were prepared in aqueous medium in the following manner: 50mL of aqueous solution of PVP was mixed with 10mL of alcoholic solution of cobalt (II) chloride hexahydrate in different molar compositions as given in the Table 1. The aqueous solution of PVP was colourless and alcoholic solution of cobalt salt was ink blue in colour.

The resulting mixtures were stirred on magnetic stirrer at room temperature till the volume was reduced to about half of the initial volume. The thickened masses were evaporated to dryness in oven at 70-80 °C for 9-10 hours. Shining crystals having ink blue colour, whose intensities increased with increase in PVP-cobalt composition, were obtained.

The crystals showed hygroscopic properties. They were soluble in water as well as in ethanol producing pink and blue colours respectively.

A complex (C5A) with 25% aqueous solution of PVP (30K) and 0.5 molar **aqueous** solution of cobalt (II) chloride was also prepared, by taking the same volumes of reactants as in the previous case, to study the effect of solvent on the complex formation.

Crystals thus obtained were characterized by FTIR, 1H-NMR and 13C-NMR. Fourier Transform Infra Red (FTIR) spectra of the prepared samples, pure samples of PVP and cobalt (II) chloride hexahydrate were recorded on a Jasco model FTIR – 4100 spectrophotometer in 400-4000 cm^{-1} range in the form of KBr pellets.

The signals corresponding to different groups are tabulated. 1H-NMR and 13C-NMR of the sample, C5 were recorded on a JNM-400 model, Jeol 400-MHz spectrophotometer. FTIR spectroscopy and NMR spectroscopy are very useful techniques to examine the structure and structural transformation of materials.

3. RESULTS AND DISCUSSION

3.1. FTIR Spectra

The most useful and simple physical method for determining the functional groups on polymers and the formation of complexes with metal ions is the IR spectroscopy. It helps in the location of coordination sites in the metal complexes with polymeric legends. The FTIR spectrum of pure PVP clearly indicates that the observed absorption peaks correspond to the characteristic chemical bonds present in PVP.

The C=O groups of pure PVP show a prominent peak at 1659.4 cm-1 in FTIR spectrum which is characteristic of C=O bond in PVP (i.e., amide C=O bond). This characteristic peak can be investigated to explore the interaction between PVP and metal ions. The FTIR peaks of C=O groups in the PVP-cobalt complexes prepared are given in the Table 1.

Table 1 Comparison of Stretching frequencies of C-N-C, N-C and C=O bonds in poly (vinylpyrrolidone) - Cobalt Complexes

Sample	CNC Stretching	N-C Stretching	C=O Stetching
PVP – 30K	1443.5	1292.1	1659.4
C1	1441.5	1292.1	1653.7
C2	1440.6	1291.1	1660.4
C3	1440.6	1291.1	1661.4
C4	1441.5	1292.1	1651.7
C5	1441.5	1291.1	1660.4
C5A	1441.5	1291.1	1659.4
C6	1441.5	1292.1	1660.4
C7	1443.5	1293.0	1651.7
C8	1441.5	1291.1	1651.7
C9	1440.6	1291.1	1659.4

From the table it is evident that there is no observable change in C-N-C and N-retching frequencies in all the samples. But there is a variation in stretching frequency of carbonyl C=O. The shifts in the peaks towards lower wave number region indicate that C=O bond is getting weakened and there exists

an interaction between cobalt ions and PVP through oxygen.

Further it is observed that the order of interaction between PVP and cobalt ions from weak to strong is: (i) C1, C4, C7 (ii) C2, C5, C8 (iii) C3, C6, C9. In other words there is decrease in the stretching frequency of C=O with increase in the Co ion concentration keeping amount of PVP constant. This implies that there is increase in the interaction between PVP and metal ion with increase in the concentration of metal ion.

Stretching frequency of C=O increases with increase in PVP concentration keeping Co^{+2} ion concentration constant. This implies that the interaction between PVP and metal ions is not much favoured by the increase of only PVP concentration keeping metal ion concentration same.

Moreover, between C5 and C5A, in C5A the shift in the stretching frequency of C=O towards the low wave number direction is more, indicating more interaction between PVP and cobalt ions when aqueous solution of cobalt chloride is used instead of alcoholic solution during preparation.

3.2. 1H NMR

1H NMR gives the information about the types of protons, number of each type of proton and their environments. Thereby it helps in arriving at important conclusions about the structure of the polymer-metal complex. 1H NMR data: (400 MHz, DMSO): 1.316 (2H, t, J=123.535Hz, Me), 1.865 (1H, t, J=67.99Hz, CNMe), 2.05 (2H, t, J=71.28Hz, NMe), 3.155(2H, J=159.42Hz, Me), 3.554 (2H, t, J= 77.88Hz, COMe).

3.3 13C NMR

Carbon atoms form the skeleton of an organic molecule. Hence information about the carbon atoms of a molecule is very useful in the identification of the structure of the unknown compound. 13C NMR spectrum of PVP-cobalt complex shows five peaks indicating five types of carbons. Spectral data: 13C NMR (100 MHz DMSO-d6): 17.9 (CH_2), 30.9 ($2CH_2$), 33.8 (CH_2), 174.3 (C=O).

4. CONCLUSION

The metal complexes of PVP-Co were prepared in different molar compositions. FTIR spectra of all the complexes were taken and studied for the optimization of the conditions for better complication of PVP with Cobalt. The variation in the stretching frequency of C=O reveals that the formation of complex may be through Oxygen of PVP. The 1H- NMR and 13C-NMR spectral studies also supplement the same.

Based on the stretching frequencies of C=O in the samples, we can decide in which case the bond between cobalt and PVP is strong and in which it is weak.

Hence this comparative study helps us in optimizing the conditions for the preparation of PVP-metal complexes depending on whether we want to introduce metal ions into a system (as in the case of essential elements) or to remove metal ions out of a system (as in the case of heavy metal ions).

REFERENCES

1. E. Diaz, R. Valenciano, P. Landa, J. L. Arana, Gonzalez, (2002), Study of complexes of Poly (vinyl pyrrolidone) with Co2+, Journal of Polymer Test**,** 21, 247.
2. E. Diaz, R. Valenciano I.. Katime, (2004), Study of complexes of poly (vinyl pyrrolidone) with copper and cobalt on solid state, Journal of Applied Polymer Science, 93, 1512-1518.
3. I. Katime, J. R. Ochoa, (1987), Study of complexes of poly (vinyl pyrrolidone) with Cobalt and Copper, Journal of Applied Polymer Science, 34, 1953.
4. E. T.Tsuchida, H. Nishide (1977), Preparation of Polymer-Bound Dinitrogen Complexes by Direct Reactions of Polymer–Metal Complexes with Molecular Nitrogen Advanced Polymer Science, 24,1.
5. N. Giri, R. K. Natarajan, S. Gunasekaran, S. Shreemathi, (2011), 13C NMR and FTIR spectroscopic study of blend behavior of PVP and nano silver particles, Archives of Applied Science Research, 3 (5), 624-630
6. IARC Monographs Supplement, (1987) N-vinyl-2-pyrrolidone and polyvinyl pyrrolidone, IARC Monographs Supplement, 7, 1181-1187
7. Md. Saleem Khan, K Gul, N Ur Rehman, (2004), Interaction of poly vinylpyrrolidone with metal chloride aqueous solutions, Chinese Journal of Polymer Science, 22, 581-584.
8. I. A. Katime, J. R. Ochoa, Bilbao, C. S. D. Nido, (1987), Synthesis and characterization of poly (vinyl carbazole) complexes with copper (II) chloride in THF Solution, Journal of Applied Polymer Science, 34, 1953-1958.
9. B.M. Kanth, K. Kalishwaralal, M. Sriram, Suresh Babu, P. Ram Kumar, H.Youn, S. Eom, S. Gurunathan, (2010) Anti-oxidant effect of gold nanoparticles restrains hyperglycemic conditions in diabetic mice, Journal of nanobio technology, 8: 1-16.
10. Z. J. Jiang, C. Y. Liu, and L. W. Sun, (2005) Catalytic properties of silver nanoparticles supported on silica spheres, Journal of Physical Chemistry B, 109 (5), 1730–1735,
11. B. L. Rivas, G V. Seguel, C. Ancatripal (2000), Polymer metal complexes; Synthesis, characterization and properties of poly(maleic acid) metal complexes with Cu(II), C0(II), Ni(II) and Zn(II), Polymer Bulletin, 44, 5-6.
12. P. Jain, T. Pradeep, (2004), Potential of silver nanoparticle-coated polyurethane foam as an antibacterial water filter, Biotechnology Bioengineering. 90, 59**.**
13. H Hossienkhani, M Hosseinkhani, (2009), Biodegradable polymer-metal complexes for gene and drug delivery, Current Drug Safety, 4, 79-83.
14. M Adharvana Chari, D Shobha, T Kiran Kumar and K Syamasundar, (2007), Polymer (PVP) supported ferric chloride as a heterogeneous catalyst for selective deportation of aldoximes and hydrazone, Trends in Applied Sciences Research, 2(1), 80-84.
15. A. Pınar, O. Kavaklı, Gü (2004), Removal of concentrated heavy metal ions from aqueous solutions using polymers with enriched amidoxime groups, Journal of Applied Polymer Science, 93:1705-1710.

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CHARACTERIZATION AND STUDY BASED ON NOISE CONTROL FOR MOLECULAR COMPUTING: A CASE

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Abstract - Synthetic biology is a growing interdisciplinary field, with far-reaching applications, which aims to design biochemical systems that behave in a desired manner. With the advancement in nucleic-acid-based technology in general, and strand-displacement DNA computing in particular, a large class of abstract biochemical networks may be physically realized using nucleic acids. Methods for systematic design of the abstract systems with prescribed behaviors have been predominantly developed at the (less-detailed) deterministic level. However, stochastic effects, neglected at the deterministic level, are increasingly found to play an important role in biochemistry. In such circumstances, methods for controlling the intrinsic noise in the system are necessary for a successful network design at the (more-detailed) stochastic level. To bridge the gap, the noise-control algorithm for designing biochemical networks is developed in this paper. The algorithm structurally modifies any given reaction network under mass-action kinetics, in such a way that (i) controllable state-dependent noise is introduced into the stochastic dynamics, while (ii) the deterministic dynamics are preserved. The capabilities of the algorithm are demonstrated on a production-decay reaction system, and on an exotic system displaying bistability. For the production-decay system, it is shown that the algorithm may be used to redesign the network to achieve noise-induced multistability. For the exotic system, the algorithm is used to redesign the network to control the stochastic switching, and achieve noise-induced oscillations.
Keywords: Synthetic biology, biochemical engineering, molecular/DNA computing, chemical reaction networks.

1 INTRODUCTION

Synthetic biology is an interdisciplinary field of science and engineering that aims to construct biochemical systems with prescribed behaviors [1, 2]. At the theoretical level, the synthetic systems may significantly enhance our understanding of biology. At the practical level, they may have broad applications, e.g. in

medicine [3, 4, 5, 6, 7], industry [8, 9], and nanotechnology [10, 11]. The systems may also be of interest to space agencies for optimizing extraterrestrial explorations [12]. A proof-of-concept for synthetic biology is a synthetic oscillator called the repressilator, which was implemented in vivo [13]. The experimental advances since the repressilator range from isolated synthetic biochemical networks, to microorganisms containing partially, or even fully, synthetic DNA molecules (synthetic life) [14, 15, 16, 17]. Examples include microorganisms containing a synthetic bistable switch [18], and a cell-density controlling quorum sensor [19], microorganisms producing antimalarial drugs [6, 7], and synthetic systems designed for tumor detection, diagnosis and adaptive drug-response [4, 5].

The construction of biochemical networks in synthetic biology may be broken down into two steps: firstly, an abstract system is constructed, displaying prescribed properties, and taking the form of a chemical reaction network [20]. Secondly, the abstract network is mapped to a suitable physical network, which may then be integrated into a desired environment (e.g. a test-tube, a vesicle, or a living cell). Let us note that the first step generally consists of a number of sub-steps, involving mathematical analyses and computational verifications, depending on the nature of the target physical network (see also Section 2.3 and supplementary material).

In the first step of network construction, the goal is to obtain an abstract network with desired dynamics. In this paper, we consider reaction networks under mass-action kinetics: it is assumed that each reaction fires at the rate proportional to the product of the concentrations of the underlying reacting species. In this setting, we consider two dynamical models of reaction networks: the deterministic model, and the stochastic model (see supplementary material for more details). The deterministic model takes the form of the reaction-rate equations, which are ordinary-differential equations governing the time-evolution of the species concentrations. The stochastic model takes the form of a Markov chain, which may be simulated using the Gillespie stochastic simulation algorithm. The Gillespie algorithm generates random copy-number time-series, with the copy number distribution matching that obtained from the underlying chemical master equation. The stochastic model is more-detailed, taking into an account the discreteness of the species counts, and the stochastic nature of the dynamics, which may be particularly important in

biochemistry, where reaction networks may contain low-abundance species [13, 18]. On the other hand, the deterministic model is less-detailed, and more appropriate when the species are in high-abundance, and the discreteness and stochasticity are negligible.

The rest of the paper is organized as follows. In Section 2, we introduce Algorithm 1 by applying it to the test network (1), which at the deterministic level displays a globally attracting equilibrium point. We show that the algorithm can favorably modify the stationary probability distribution underlying (1) at arbitrary points of the state-space, without influencing the deterministic dynamics. For example, it is shown that the algorithm may be used to redesign (1) to achieve noise-induced multimodality (multistability). In Section 3, we apply Algorithm 1 to the exotic network (11), which at the deterministic level displays a bistability involving an equilibrium point and a limit cycle. The algorithm is used to redesign (11) to increase the stochastic switching between the two attractors, and to achieve noise-induced oscillations. Finally, in Section 4 we conclude with a summary and discussion. The notation used in the paper is introduced as needed, and is summarized at the beginning of supplementary material.

2 COMPILATION INTO DNA-BASED NETWORKS

Chemical reaction networks, whose stochastic dynamics are controlled by Algorithm 1, may be mapped to the nucleicacid- based ones. The mapping takes a different form depending on which molecular compiler is utilized and, in this section, we briefly outline two approaches. Firstly, the molecular compiler put forward, based on 4-domain signal strands, requires that the input reaction network consists of up-to second-order reactions. On the other hand, let us note that it allows reactions with identical reactants (as is the case in zero-drift networks). Thus, one is generally required to apply a single pre-compiling step, where the higher-order reactions (i.e. reactions involving three or more reactants) are approximated by systems of up-to second-order ones, before using the 4-domain DNA compiled. However, the 4-domain compiler has only been shown to preserve the deterministic dynamics when mapping an abstract network into a DNA-based one. In supplementary material, we show that the stochastic dynamics are also preserved, making the compiler compatible with the noise-control algorithm. Furthermore, we apply the

compiler to a network of the form (3) and (5), and briefly discuss the pre-compilation step, leaving the details for a future publication. On the other hand, the 2-domain molecular compiler put forward, and experimentally implemented, can be used directly, without any pre-compilation, since it automatically handles higher-order reactions.

3 DISCUSSION

In this paper, we have presented the noise-control algorithm, which is given as Algorithm 1. The algorithm maps an input chemical reaction network to output networks, all under massaction kinetics, by introducing appropriate additional species and reactions, such that the output networks satisfy the following two properties. Firstly, the output networks have the same deterministic model as the input network, in appropriate limits of some of the parameters (rate coefficients) introduced by the algorithm. Secondly, controllable state- dependent noise is introduced into the stochastic model of the output networks. Thus, Algorithm 1 may be used to control the intrinsic noise of a given reaction network under mass-action kinetics, while preserving the deterministic dynamics. Let us note that the asymptotic conditions for the algorithm parameters are necessary for preservation of the time-dependent deterministic solutions. However, the time-independent deterministic solutions (the deterministic equilibrium points), which capture important features of the deterministic dynamics, are preserved under the algorithm even if the asymptotic conditions are not satisfied.

The algorithm has been applied to a test problem, taking the form of the one-species production-decay system given by (1). Using analytical and numerical methods, we have shown that the additional intrinsic noise, introduced by the algorithm, may be used to favorably modify the stationary probability mass function at arbitrary points in the state-space, as demonstrated. For example, the noise is added to the whole interior of the state-space, while in (e) only at a single point, in both cases resulting in noise-induce bimodality. On the other hand, , by adding the noise to specific points in the state-space, the network is redesigned to display noise-induced trimodality. the blue stochastic trajectories display multistability, while the red deterministic ones remain monostable.

Algorithm 1 constitutes a qualitatively novel scientific discovery which will facilitate the progress of nucleic-acid based computing, such as DNA

computing. In particular, we put forward a hybrid approach for constructing DNA-based reaction networks: the deterministic model may be used to guide the construction of reaction networks, and then Algorithm 1 may be applied to favorably reprogram the intrinsic noise in the stochastic model, while preserving the mean-field behavior. Put another way, the deterministic stochastic hybrid approach allows one to reshape the probability distributions of target chemical species, while inheriting the fixed mean-field behavior.

REFERENCES

1. Endy D. Foundations for engineering biology. Nature, 2005;484:449–453.
2. Andrianantoandro E, Basu S, Karig DK, Weiss R. Synthetic biology: new engineering rules for an emerging discipline. Molecular Systems Biology, 2006;2:2006.0028.
3. Abil Z, Xiong X, Zhao H. Synthetic biology for therapeutic applications. Molecular Pharmaceutics, 2015;12(2):322–331.
4. Anderson JC, Clarke EJ, Arkin AP, Voigt CA. Environmentally controlled invasion of cancer cells by engineered bacteria. Journal of Molecular Biology, 2006;355(4):619– 627.
5. Benenson Y, Gil B, Ben-Dor U, Adar R, Shapiro E. Autonomous molecular computer for logical control of gene expression. Nature, 2004;429:423–429.
6. Ro D, Paradise EM, Ouellet M, Fisher KJ, Newman KL, Ndungu JM, et al. Production of the antimalarial drug precursor artemisinic acid in engineered yeast. Nature, 2006;440:940–943.
7. Westfall PJ, Pitera DJ, Lenihan JR, Eng D, Woolard FX, Regentin R, et al. Production of amorphadiene in yeast, and its conversion to dihydroartemisinic acid, precursor to the antimalarial agent artemisinin. Proc. Natl Acad. Sci. USA, 2012;109: E111–E118.
8. Widmaier DM, Tullman-Ercek D, Mirsky EA, Hill R, Govindarajan S, Minshull J, et al. Engineering the salmonella type III secretion system to export spider silk monomers. Molecular Systems Biology, 2009;5(309).
9. Sedlak M, Ho WY. Production of ethanol from cellulosic biomass hydrolysates using genetically engineered saccharomyces yeast capable of cofermenting glucose and xylose. Applied Biochemistry and Biotechnology, 2004;114(1):403–416.
10. Ball P. Synthetic biology for nanotechnology. Nanotechnology, 2005;16:R1–R8.
11. Jungmann R, Renner S, Simmel FC. From DNA nanotechnology to synthetic biology. Applied Biochemistry and Biotechnology, 2008;2(2):99–109.
12. Menezes AA, Cumbers J, Hogan JA, Arkin AP. Towards synthetic biological approaches to resource utilization on space missions. Journal of The Royal Society Interface, 2015;12(102):20140715.
13. Elowitz MB, Leibler S. A synthetic oscillatory network of transcriptional regulators. Nature, 2000;403:335–338.
14. Deamer D. A giant step towards artificial life? Trends in Biotechnology, 2005;23(7):336–338.
15. Glass JI, Assad-Garcia N, Alperovich N, Yooseph S, Lewis MR, Maruf M, et al. Essential genes of a minimal bacterium. Proceedings of the National Academy of Sciences, 2006;103(2):425–430.

16. Gibson DG, Benders GA, Andrews-Pfannkoch C, Denisova EA, Baden-Tillson H, Zaveri J, et al. Complete chemical synthesis, assembly, and cloning of a Mycoplasma genitalium genome. Science's STKE, 2008;319(5867):1215–1220.
17. Gibson DG. Creation of a bacterial cell controlled by a chemically synthesized genome. Science, 2010;329(5987):52–56.
18. Gardner TS, Cantor CR, Collins JJ. Construction of a genetic toggle switch in Escherichia coli. Nature, 2000;403:339–342.
19. You L, Cox Ill RS, Weiss R, Arnold FH. Programmed population control by cell-cell communication and regulated killing. Nature, 2004;428:868–871.
20. Plesa T, Vejchodsk´y T, and Erban R. Chemical reaction systems with a homoclinic bifurcation: an inverse problem. Journal of Mathematical Chemistry, 2016;54(10):1884–1915.

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AN ANALYTICAL RESEARCH BASED ON ELECTRICAL DETECTION OF RESONANCE OF A SINGLE ELECTRON FOR TRANSISTOR

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Abstract - The ability to manipulate and monitor a single-electron spin using electron spin resonance is a long-sought goal. Such control would be invaluable for nanoscopic spin electronics, quantum information processing using individual electron spin quits and magnetic resonance imaging of single molecules. There havebeen several examples of magnetic resonance detection of a single-electron spin in solids. Spin resonance of a nitrogen vacancy defect centre in diamond has been detected optically, and spin precession of a localized electron spin on a surface was detected using scanning tunnelling microscopy. Spins in semiconductors are particularly attractive for study because of their very long DE coherence times. Here we demonstrate electrical sensing of the magnetic resonance spin-flips of a single electron paramagnetic spin centre, formed by a defect in the gate oxide of a standard silicon transistor. The spin orientation is converted to electric charge, which we measure as a change in the source/drain channel current.

Our set-up may facilitate the direct study of the physics of spin DE coherence, and has the practical advantage of being composed of test transistors in a conventional, commercial, silicon integrated circuit. It is well known from the rich literature of magnetic resonance studies that there sometimes exist structural paramagnetic defects near the Si/SiO2 interface. For a small transistor, there might be only one isolated trap state that is within a tunnelling distance of the channel, and that has a charging energy close to the Fermi level. When a defect is present, the source/drain channel current can experience random telegraph signal (RTS), jumping between two discrete current values. These arise from two possible trapped electric charge states of the defect. The two charge states can correspond to the two spin orientations of a trapped electron.

Field effect transistor (FET) current senses electrostatic charge

(by definition), and can thus sense single-electron spin resonance. In view of the high degree of perfection of silicon devices, 80% of the transistors that we tested actually had no such trap states at all. In those cases we applied a high voltage spike to the gate in an attempt to induce a paramagnetic defect for study. Electron spin in low-transition-temperature semiconductors is now recognized to have considerable potential for storing and manipulating quantum information. Some proposed quit architectures trap electron spin in a controlled potential well at the Si–Ge interface and use transistor-like structures for sensing. Figure 1a sketches a simplified version of the transistor device in our experiment.

The essential requirement for detecting a single spin flip is the conversion of spin-orientation to electric charge. In our approach, the Fermi level is adjusted so that it lies between the upper and lower Zeeman levels as illustrated in the lower Zeeman level is occupied by one electron, as in it cannot accept any additional electrons from the Fermi level. If only the upper Zeeman level is occupied, then an additional electron can be transferred from the Fermi Sea to the lower Zeeman level. The distinction between two trapped charges versus one trapped charge 1e2 can be sensed, because an FET is basically an electrometer. Thus spin orientation is converted to electric charge, which is sensed by the source/drain current in an FET transistor. Our n-channel Si transistors are operated near pinch-off, where the channel size is roughly 300 nm wide £ 240 nm long.

The signature of a single trap state is shown in the RTS source/drain current of Superimposed on the monotonically increasing background source/drain current is stochastic switching between two discrete values of channel current. This switching is the well-known RTS that is a hallmark of the capture and emission of one electron by a single trap state. The well-defined RTS evolution in demonstrates that over the 690 to 740mV range, the trap is energetically well isolated from other traps. A filled trap implies electrostatic repulsion that diminishes the channel current. At high gate voltages the Fermi level EF is well above the trap level ET. Thus the trap is almost always filled, repelling electrons and allowing less current to flow in the source/drain channel. In contrast, at low gate voltages when EF is well below ET, the trap is empty most of the time and the high current state is more probable.

At the midpoint, when EF <ET the probability of the trap filling is

about 50%. Thus the source/drain current senses the charge state of the trap. The trap studied here is a very stable defect because the behavior is reproducible over many thermal cycles from room temperature to liquid He3 temperatures. From the signal-to-noise ratio, we find that the charge sensitivity of the data acquisition system is 1024e Hz21/2.The Zeeman shift of the single trap13 can readily be identified by studying the trap energy shift of the point at which the probability of the trap filling is 50% (where EF lines up with the trap energy ET), as a function of magnetic field. The Zeeman shift of this point as a function of an in-plane magnetic field. The trap energy shift was inferred from the gate voltage shift by using the procedure in ref. On the basis of the sign of the Zeeman shift, ref.

The charging transition transfers from a single-charge state 1e2 to adouble-charge state 2e2; that is, the charging is rather than. In the energy diagram of the empty trap is modeled as an unpaired electron (for example, a dangling bond) that occupies the level ET (the central red dashed line). In the presence of the magnetic field B, the single-electron state undergoes Zeeman splitting, indicated by the two solid lines at energies ET ^ (1/2) EZ.At low temperatures and high fields, only the lower spin state is occupied. If EF is raised, an additional electron from the channel cantunnel into the upper spin state in forming a two-electron singlet state (for example, a lone pair).

Thus the Fermi energy required for forming the two-electron state would increase when B is increased, as suggested. In contrast, an initially 'spineless' empty trap would fill the lower Zeeman level, producing the opposite field dependence—that is, the required Fermi energy would decrease with increasing B, contrary to observation. Therefore the initial empty trap begins in a 1e2 paramagnetic state(S ¼ 1/2) (high current state) while the filled trap (lower current state) is a 2e2 singlet state. Our electron spin resonance (ESR) detection scheme is based on the changing balance between the two source/drain current states of the transistor, when the Armor precession frequency produces spin flips. In effect, this is transistor-current-detected ESR, as illustrated in the paramagnetic spin flips; the lower Zeeman level becomes available for trapping an additional electron. The trapping event diminishes the average source/drain current. A rate equation analysis of this trap/channel configuration gave the ESR-induced change in trap-filling probability.

To detect the ESR-microwave-induced change, we measured channel current at a fixed microwave frequency for 300 ms, during which there are about a few thousand RTS switching events, yielding good statistics for the average source/drain current. Represents a fragment of such a trace over a 1 ms time interval. To complete the current versus magnetic field dependence, full 300-mstraces are taken at 150–250 different magnetic fields.

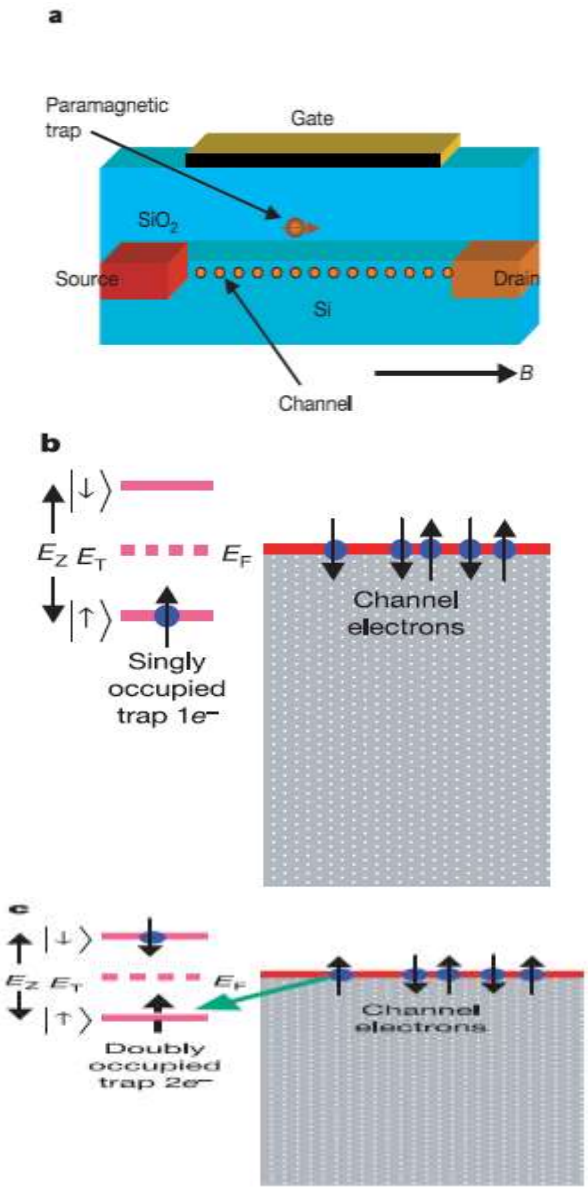

Figure 1 The mechanism for spin-to-charge conversion. contractile dysfunction

Both agreed with the well-established values of g <1.998. Because conduction electrons always18 have and paramagnetic centres inSiO2 always have g. 2, our results indicate a paramagnetic centrein the oxide, or at the SiO2/Si interface. Our observed g-value is somewhat larger than that for some known paramagnetic centres near the Si/SiO2 interface. A Pb paramagnetic centre is known to have a g-factor of 2.006 along the k100l direction, whereas the E0centre is expected to have g ¼ 2.001. One possibility is that we are looking at a centre that has a local structure different from that of these two typical examples.

Another possibility is that the low density conduction channel electrons might have slight ferromagnetic ordering; giving rise to a local field that slightly increases the apparent g-factor of the trap. The full-width, half maximum line width of the observed resonance is about 5–10 G, which corresponds to the spin-spin relaxation time T2 of about 0.1 ms. This time is much less than the typical100-ms lifetime for isolated paramagnetic spins (the paramagneticE0 centre in irradiated fused quartz has a T2 of about 25 ms at room temperature; see for example, ref. 19) in SiO2. There might be additional DE coherence caused by the conduction electrons in the channel, or it might be caused by power broadening. Indeed, our microwave power produces a Rabi frequency gH1 <10 kHz, comparable to the trap tunnelling time of about 20 kHz, where g is the gyro magnetic ratio and H1 is the microwave field.

For actual quantum information processing, the source/drain channel shouldonly be un-pinched at the end of a quantum computation for Readout, well within the T1 lifetime. At the strong Rabi frequency of gH1 <10 kHz that is present at the end plate of our rectangular waveguide, nonlinear effects emerge. At lower microwave powers gH1 <1 kHz, the single occupancy trap probability is correctly observed to diminish under ESR, as expected from the reasoning. However at higher powers, gH1 <10 kHz, the ESR-induced-current signal inverts, leading to an increase in occupancy trap probability, as plotted in we plotted the signal at high microwave power because it has a better signal-to-noise ratio. We also see a nonlinear ESR response in the tunnelling dynamics. As shown in, the frequency of RTS jumps, which is proportional to the tunnelling rate, can change as much as 10% at the ESR condition.

At low microwave power, gH1 <1 kHz, the tunneling rate increases at resonance, but at high Rabi frequency,gH1<10 kHz, the

tunnelling rate inverts. These inverted signals in both the source/drain current, and the tunneling frequency, are only observed for high Rabi frequencies that are comparable to the tunnelling frequency. The nonlinear ESR response may be partly associated with non-resonant microwave induced changes in the tunnelling rate, but we have not yet identified the dominant nonlinear mechanism.

Our evidence in support of the ESR signal arising from a single electron is summarized as follows:

1. The ESR signature is only observed in the random telegraph signal crossover region, predominantly between points.
2. The random telegraph signal switching statistics, and thermal occupation probabilities, correspond to those of a single defect.
3. The g-factor value rules out channel electrons. The experiment demonstrates that an FET channel can effectively monitor the magnetic resonance of an adjacent single spin.

REFERENCES

1. Kohler, J. et al. Magnetic resonance of a single molecular spin. Nature 363, 242–244 (1993).
2. Wrachtrup, J., von Borczyskowski, C., Bernard, J.,Orrit, M.& Brown, R. Optical detection of magnetic resonance in a single molecule. Nature 363, 244–245 (1993).
3. Jelezko, F., Gaebel, T., Popa, I., Gruber, A. & Wrachtrup, J. Observation of coherent oscillations in a single electron spin. Phys. Rev. Lett. 92, 076401 (2004).
4. Manassen, Y., Hames, R. J., Demuth, J. E. & Castellano, A. J. Direct observation of the precession of individual paramagnetic spins on oxidized silicon surfaces. Phys. Rev. Lett. 62, 2531–2534 (1989).
5. Durkan, C. & Welland, M. E. Electronic spin detection in molecules using scanning-tunnelling microscopy- assisted electron-spin resonance. Appl. Phys. Lett. 80, 458–460 (2002).
6. Tyryshkin, A. M., Lyon, S. A., Astashkin, A. V. & Raitsimring, and A. M Electron spin relaxation times of phosphorus donors in silicon. Phys. Rev. B 68, 193207 (2003).
7. Poindexter, E. H. in Semiconductor Interfaces, Microstructure, and Devices (ed. Feng, Z. C.) Ch. 10, 229–256 (Inst. Phys. Publ., Bristol, Philadelphia, 1993).

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RECENT INNOVATIVE RESEARCH FOR TRAINING & DEVELOPMENT FOR QUALITY OF WORK LIFE

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Abstract- In this focused world, preparing assumes a paramount part in the skillful testing organization about benefits of the business. Preparation will be those nerve that suffices those have from claiming familiar Also smooth birch working of fill in which serves over upgrading those nature of worth of effort existence about representatives authoritative improvement a really. Advancement is a procedure that prompts qualitative and in addition quantitative advancements in the organization, particularly toward those manageress levels; it is lesquerella acknowledged with physical aptitudes may be additional worried for knowledge, values, attitudes Also self-destructive considerations and conduct with particular abilities. Hence, development can be said as a continuous process whereas training has specific areas and objectives. So, every organization needs to study the role, importance and advantages of training and its positive impact on development for the growth of the organization. Quality of work life is a process in which the organization recognizes their responsibility for excellence of organizational performance as well as employee skills. Training implies constructive development in such organizational motives for optimum enhancement of quality of work life of the employees. These types of training and development programs help in improving the employee behaviour and attitude towards the job and also uplift their morale. Thus, employee training and development programs are important aspects which are needed to be studied and focused on. This paper focuses and analyses the literature findings on importance of training and development and its relation with the employees' quality of work life.

Keywords: Human Resource Management, Training, Development and Quality of work life.

1. INTRODUCTION

In the changing phase of the market, all organizations have a number of opportunities to grab and number of challenges to meet. Due to such environment, the dynamic organizations are smoothly surviving in the present competition. While facing these challenges, there is a great

pressure of work on the shoulders of management. It is a responsibility of the management to make necessary changes at the workplace as per the requirement of the job. To survive in the competition and to meet the requirements, the management needs to change their policies, rules and regulations. The organizations face a lot of pressure in the competence for a talented work force, for constantly improving the production methods, entrants of advanced technology and for the employees who are inclined to achieve work life balance. The success of any organization depends upon the quality of the work force, but in order to maintain the quality of the work force, many organizations come across a number of obstacles. These obstacles include attraction of the qualitative workforce towards the organization, recruitment of intelligent, dynamic as well as enthusiastic people in the organization, motivation of current employees with different techniques and retention of the current workforce for maintaining the organizational status in the competitive market. For surviving the business and becoming a successful pillar in the market; training is a tool that can help in gaining competitive advantages. Training proves to be a parameter for enhancing the ability of the workforce for achieving the organizational objectives. Good training programs thus result in conquering of the essential goals for the business. Hence, training is significant for giving a dynamic approach to the organization. This dynamic approach is necessary because every organization that adopts a controlled way of functioning may not be able deliver consistent results but a dynamic and flexible organization may do so. This is possible only because of improved quality of work life through implementation of training programs.

A high degree of quality of work life in the organization results in increased profits, higher employments and accentuating demands in the market. Improving the quality of work life is a continuous and progressive process of the organization. Quality of work life concerns with the requirements, needs, working environment and job design of the employees at workplace. According to Guna Seelan Rethinam Maimunah and European foundation for the improvement of Living Conditions (2000), Quality of work life is a multi-dimensional construct, made up of interrelated factors. Quality of work life is associated with job satisfaction, job involvement, job security, productivity, health, safety, competence development, professional skills, balance between work and non work life of the employee.

The focus of Human Resource Development is on developing the most superior workforce which helps the organization for successive growth. All employees are needed to be valued and they should apply collective efforts in the labor market every time. This can only be achieved through proper and systematic implementation of employee training and development programs. Employees are always regarded with development in career-enhancing skills which leads to employee motivation and retention. There is no doubt that a well trained and developed staff will be a valuable asset to the company and thereby will increase the chances of their efficiency and effectiveness in discharging their duties.

Training is a learning experience which has a capacity to make positive changes and reach up to the desired objectives of the organization. It improves the ability of the employee to perform the job efficiently and with excellence. Training and development programs are the basic structural and functional foundations for the development of the employees. These foundations are important for guiding the employees through different situations. Training and Development programs are the framework for helping employees to develop their personal and professional skills, knowledge, and abilities. Training imparts knowledge to the employees regarding different issues in the organization and the proper execution of these programs result in number of benefits such as development of profitable, adaptable as well as efficient organization and productive & contented employees. It is useful in the following manner:

- Employees are able to balance their work life and personal life in a better manner which leads to reduction of stress.
- Such programs help in improving physical and psychological health of the employees, thereby bringing down the absenteeism rate.
- These programs develop the employee morale, increase the productivity, job satisfaction and commitment of the employees towards the organizational goals.
- These programs also aim at the progress of the individuals in their personal and professional lives.
- They improve the communication between all levels of management which helps in minimizing conflicts between different levels of employees.
- Such types of programs lead to effective negotiation and enable the designing of the contracts which satisfy all sorts of employees.

- These programs enhance efficiency of management and strengthen employee organization.

2. LITERATURE REVIEW

2.1 Training and Development

According to the Michel Armstrong, "Training is systematic development of the knowledge, skills and attitudes required by an individual to perform adequately a given task or job". (Source: A Handbook of Human Resource Management Practice, Kogan Page, 8th Ed., 2001)

According to the Edwin B Flippo, "Training is the act of increasing knowledge and skills of an employee for doing a particular job."
(Source: Personnel Management, McGraw Hill; 6th Edition, 1984)

The term 'training' indicates the process involved in improving the aptitudes, skills and abilities of the employees to perform specific jobs. Training helps in updating old talents and developing new ones. 'Successful candidates placed on the jobs need training to perform their duties effectively'.
(**Source:** Aswathappa, K. Human resource and Personnel Management, New Delhi: Tata McGraw-Hill Publishing Company Limited, 2000, p.189)

The principal objective of training is to make sure the availability of a skilled and willing workforce to the organization. In addition to that, there are four other objectives: Individual, Organizational, Functional, and Social.

- **Individual Objectives –** These objectives are helpful to employees in achieving their personal goals, which in turn, enhances the individual contribution to the organization.
- **Organizational Objectives –** Organizational objectives assists the organization with its primary objective by bringing individual effectiveness.
- **Functional Objectives –** Functional objectives are maintaining the department's contribution at a level suitable to the organization's needs.
- **Social Objectives –** Social objectives ensures that the organization is ethically and socially responsible to the needs and challenges of the society.

Further, the additional objectives are as follows:

- To prepare the employees both new and old to meet the present as well as the changing requirements of the job and the organization.
- To prevent obsolescence.
- To impart the basic knowledge and skill in the new entrants that they need for an intelligent performance of a definite job.

- To prepare the employees for higher level tasks.
- To assist the employees to function more effectively in their present positions by exposing them to the latest concepts, information and techniques and developing the skills they will need in their particular fields.
- To build up a second line of competent officers and prepare them to occupy more responsible positions.
- To ensure smooth and efficient working of the departments.
- To ensure economical output of required quality.

2.2 Types of training and development programs which are provided to the employee

Different practices are followed in different industries and in different organizations too. So, the need of training and development programs is depending up on the requirements of the job profile. Therefore there are various types of programs shared by different authors. The types of training and development programs are as follows:

Types of Training

On- the -Job Training	Off –the- Job Training
Job Instructions	Programmed Instructions
Apprenticeship & Coaching	Class Room Lectures
Job Rotation	Simulation Exercises
Committee Assignment	Business Games
Internship Training	- Case Study Method
Training through step by step	- Audio- visual Method
	- Experiential Exercises
	- Vestibule training
	- Computer Modelling
	- Behavioural Modelling
	- Role Playing
	- Conference/ Discussion Method
	- Workshop / Seminars

(Source: Researcher's Contribution**)**

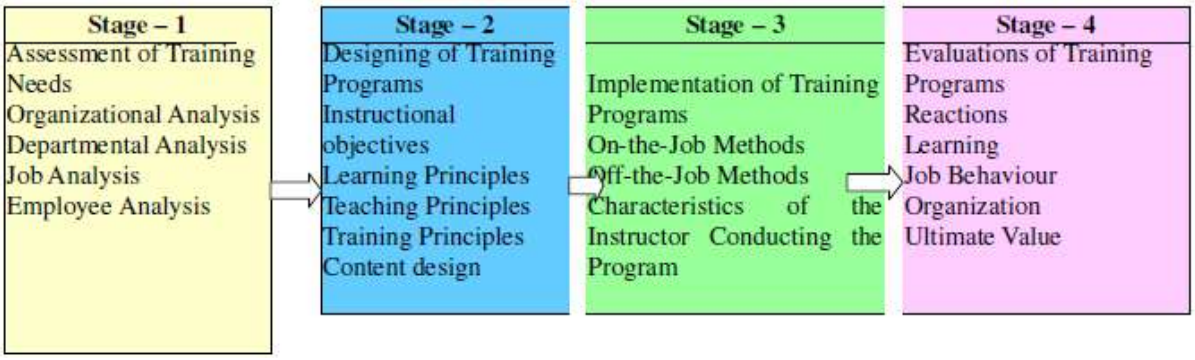
2.3 Stages of training and development programs

Training should be conducted in a systematic order so as to derive expected benefits from it. The training system involves four stages, namely:

a) Assessment of training and development programs needs.
b) Designing the training and development programs.
c) Implementation of the training program

d) Evaluation of the training program

Stages in Training and Development Programs



(Source: P. Subba Rao, "Essentials of Human Resource management and Industrial Relations" Himalaya Publication House, 3rd Revised & Enlarged Edition 2009, Pg-199-203)

3. DEVELOPMENT

Representative improvement projects need aid outlined with meet particular objectives, which help both Worker Furthermore authoritative adequacies. There would a few steps in the transform about management improvement. These incorporates reviewing authoritative objectives, assessing the organization's present administration resources, deciding singular needs, planning actualizing advancement projects and assessing those adequacy from claiming these projects Also measuring those sway about preparing ahead members personal satisfaction about worth of effort term. In simple way, it can be denoted as per the following formula.

Employee Development = Employee Education + Employee Skills + Training Effectiveness + Employee Quality of work life There are various authors who shared their views regarding the role of training and development in different aspects. The following Table 1 provides the opinions of different authors regarding the view of training and development.

4. QUALITY OF WORK LIFE

The term 'Quality of work life' appeared in research journals in 1970s. The quality of work life is not only concerned with the monetary aspects but conditions of employment, interpersonal conflicts, job pressure, lack of freedom and absence of challenging work, etc. QWL is a comprehensive programme designated to improve employees' satisfaction. It is a way of thinking about people, work and organization and creates a sense of fulfillment in the minds of the employees and contributes toward greater job satisfaction, improving productivity, adoptability and overall effectiveness of an organization. QWL may be

characterized similarly as the ideal states Furthermore situations of a working environment that help Push Worker fulfillment giving them for rewards, work security, Also Growth chances. The accompanying table reveals to that that different writer need shred distinctive segments viewing nature about worth of effort term.

According to the Walton (1975) QWL covers the Adequate and Fair Compensation, Safe and Healthy Working Conditions, Immediate Opportunity to Use and Develop Human Capacities, Opportunity for Continued Growth and Security, Social Integration in the Work Organization, Constitutionalism in the Work Organization, Work and Total Life Space and Social Relevance of Work Life. As per the view of Stein (1983) QWL deals with the components like Autonomy or being independent, being recognized and prized, Belongings, progress and development, External reward for employees. Levine, Taylor and Davis (1984), focused on the factors such as Respect from supervisor and trust on employee's capability, Change of work, Challenge of the work, Future development opportunity arising from the current work, Self esteem, Scope of impacted work and life beyond work itself, Contribution towards work. Mirvis and Lawler (1984) explain the safe work environment, equitable wages, equal employment opportunities and opportunities for advancement.

Baba and Jamal (1991) tells about the Job satisfaction, job involvement, work role ambiguity, work role conflict, work role overload, job stress, organizational commitment and turn-over intentions. CAI Hui-ru (1994) focused on the Living quality of workforce which involves the compensation, welfare, work safety, work protection for the employees, It also includes the Social quality which explains the relationship with the boss, colleagues, and customers; the next important component is Growth quality of employee that consists participation management, promotion, self-growth, self-esteem and work characteristic. As per the view of Lau RSM, Bruce EM (1998), QWL deals with the Job security, Reward systems, Training, Carrier advancements opportunities, Participation in decision in decision making.

According to the Chandranshu Sinha (2012), there are twelve important factors of quality of work life. These working factors are important for the development of organizations' most valuable assets (employees). These factors are also useful for gaining competitive advantage in the market. These factors are communication, career development and growth, organizational commitment,

emotional supervisory support, flexible work arrangements, family response culture, employee motivation, organizational climate, organizational support, job satisfaction, rewards and benefits and compensation. Likewise different authors have suggested different suggestions for the improvement of quality of work life.

5. CONCLUSION

Preparing and advancement projects assume a basic part on each association. These projects enhance Worker execution toward workplace, it updates representative learning Furthermore enhances their individual abilities Furthermore it serves clinched alongside avoiding manageress oldness. With the utilization about these programs, it is less demanding for those management on assess the vocation execution appropriately make choices in representative Promotion, rewards, compensations, welfare facilities, and so on. These training programs also help the managers in succession planning, employee retention and motivation. It creates Efficient and Effective employees in the Organization. The need for training & development is determined by the employee's performance deficiency, computed as follows:

Training & Development need = Standard performance – Actual performance

Training enhances the overall performance of an organization in various ways. The major areas where employees are normally trained in an organization are Soft- skill Development, Personality Development, Interpersonal Relationship, Problem solving techniques, Managerial and Supervisory Training Program, quality improvement programs, technical processes, quality circle programs, Time management skills, employee efficiency development programs, violence prevention programs, regulatory compliances, goal setting and implementation of programs, workplace safety management, workplace communication, and so on. Training enables the employees to develop their skills within the organization and hence naturally helps to increase the organization's market value, earning power of the employees and job security of the employees. Training moulds the employee's attitude and helps them to achieve a better cooperation within the organization. Training and Development programs improve the quality of work-life by creating an employee supportive workplace.

REFERENCES

1. P. Subba Rao (2009), "Essentials of Human Resource management and Industrial Relations", Himalaya Publication House, 3rd Revised & Enlarged Edition.

2. Michel Armstrong (2001), "A Handbook of Human Resource Management Practice", Kogan Page, 8th Editon.
3. Mamoria, C. B. (1995), "Personnel Management (Management of Human resources)", Himalaya Publishing House, Bombay.
4. Chaudhuri, Manodip Ray. "Employ Training Grooming for a better tomorrow". HRM Review, Vol.4, No.1, January 2004.
5. Dwivedi, R. S. (2001), "Managing Human Resources-Personnel Management in Indian Enterprises", New Delhi: Galgotia Publishing Company, New Delhi.
6. Aswathappa, K. (2000), "Human resource and Personnel Management", Tata Mcgraw-Hill Publishing Company Limited, New Delhi.
7. Guna Seelan Rethinam, Maimunah Ismail (2008) "Constructs of Quality of Work Life: A Perspective of Information and Technology Professionals", Universiti Putra Malaysia, Malaysia.
8. ZHU Su-li, LONG Li-rong (2008), "The Treadmill Effect on the Utility of Quality of Working Life", Wuhan University of Technology, P.R.China.
9. Chao, Chih Yang Huang, Yi Li Lin, Chih Wei, "The Relationship between Leadership Behavior of a Principal and Quality of Work Life of Teachers in an Industrial Vocational High School in Taiwan".
10. D.R. Saklani, 2004 Quality of Work Life in the Indian Context, "An Empirical Investigation, Commerce Department, Shaheed Bhagat Singh College, University of Delhi".
11. Seyed Mehdi Hosseini, Gholamreza Mehdizadeh Jorjatki (2010) "Quality of work life (QWL) and Its relationship with performance", University Of Firouzkouh Branch,Tehran.
12. Hanita Sarah Saad, Ainon Jauhariah Abu Samah and Nurita Juhdi, "Employees' Perception on Quality Work Life and Job Satisfaction in a Private Higher Learning Institution", International Review of Business Research PapersVol. 4 No.3 June 2008 Pp.23-34.
13. B. N. Sivakumar, V. Navaneethakumar, "Evaluating the training effectiveness among managers in manufacturing industry with reference to Krishnagiri District" European Journal of Social Sciences. ISSN 1450-2267, Vol. 27,No.3 pp.408-416.
14. Dr. G.K.Deshmukh, Dr. Sanskrity Joseph, Ms. Rasmi Dewangan. (January 2013)"Training Redial: Three Factor Approach" Research world, Journal of Arts, Science and Commerce, E-ISSN 2229-4686 and ISSN 2231-4172.
15. T S Nanjundeswaraswamy, Dr Swamy D R,(May-Jun 2012), International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622 www.ijera.com Vol. 2, Issue 3, , pp.1053-1059.

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APPLICATIONS AND APPROACHES FOR HEALTH INFORMATICS FOR CARING FOR CHILDREN BASED ON INNOVATIVE SOFTWARES

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Abstract- Health Informatics (HI) is an integration of health information and technology to be improving levels of efficiency in Occupational Therapy (OT) care managers in the community. The purpose of this study was to develop HI in the community for care managers caring for children from birth to 6 years old. Fifteen participants were occupational therapists, who worked as care managers in the community. The research instrument was a questionnaire that comprised 22 items in 4 aspects including equirement, function, usability and security. The HI system in this study comprised 6 parts such as log in, data display and summary, history, assessment, intervention and follow -up.
Keywords: Health Informatics, Care Manager, Community-Based Services, Children

1. INTRODUCTION

The current population in Thailand is about 63.50 million people, of which roughly 7.65 million are in the birth to 6 year-old age group (NICDF, 2011). The number in this age group is declining continually because of a dropping birth rate from 31.80% during 2001-2005 to an estimated 19.70% in 2026-2030 (HIS, 2015). As Thailand will have become an aging society by 2064-2574 (Prasatkun, 2016), earlier child development is encouraged as a way to increase the quality of future human resources (Wungchanthanon et al., 2014).

Therefore, the National Economic and Social Development Plan intends to encourage appropriate health services for children, which supports a healthy community system in all dimensions (ONESDB, 2017). However, health professionals in communities are limited. Health service providers, who work in communities have more than one role to play and they operate with community members as a team. Care managers play an important role in community hospitals in Thailand. They are responsible for providing primary health services such as developmental screening, home visiting, home programing, database recording and so on.

Therefore, some health service providers have been health professionals and also care managers at the same time. Most care managers in Chiang Mai province are occupational therapists.

The Model of Human Occupation (MoHO) has the principle of applying human activity to community-based practice (Scaffa and Reitz, 2014). This model focuses on community change and describes its structures in the human system, of which there are two; the trajectory of change and adaptive and maladaptive cycles (Scaffa, 2001). The model can be applied to encourage community response, involvement and empowerment by analyzing internal needs such as identity, values and interests, as well as external environments, for instance, a physical and social environment. Health service providers have to participate in community-based service and promote community health by increasing community performance for making decisions and solving problems regarding health. This performance will develop into community based skills that strengthen the capacity of the community. In fact, community-based practices in health promotion, community knowledge and community participation make the community stronger with community members in good health (Solomon and Obrien, 2011).

Health Informatics (HI) is an integration of health information and technology that designs, develops and applies innovated information technology in public health services (Thiratsirikul and Caefan, 2010; Hebda et al., 2005). In particular, evaluating and monitoring the health of a community population tends to use HI to develop effective service systems (Beck et al., 1998). In developing HI to be consistent with the context of healthcare delivery, it comprises three levels such as the operational, management and executive information system level (SISTH, 2013). In the 21st century, the national era of information technology is vital to the health care system by designing, developing and applying integrated health and technology information for health care services. This system can support health service providers in making decisions for evaluating, treating and following up health outcomes effectively (Yana and Sirapanitkul, 2015). The HI has been currently used in both written and electronic forms of management and stored as many medical information profiles per Thai hospitals. It needs to be more accurate data during the process of diagnosis and treatment plans by, reducing those duplicated data and improving efficient services (Triviriyanupab et al., 2013). As a result, the government recognized

the importance of developing HI and has set a policy to reform the public health system and improve the quality of life for people in the community. In particular, health services for children in the community are termed as holistic child care, which is based on the understanding that all children could have various programs of potential enhancement (Yana and Sirapanitkul, 2015). Therefore, a development of information systems for children at birth to six years of age would be making a big change of better quality of life in a recognition of government policy.

The HI is studied quite widespread in medical and nursing professions with community hospitalized contexts of Thailand remains using structured forms of medical information system, which has focused on a decision making and organizing for national health promotion programs including a hospitalized client classification system (Kuntawong, 2007; Rimsuk, 2012). However, it rarely develops into other paraprofessionals such as Occupational Therapy (OT) services (Schaper and Pervan, 2007). Therefore, the purpose of this research was to develop HI in community-based services for OT in children from birth to 6 years of age.

2. MATERIALS AND METHODS

This research was approved by the Research Ethics Committee of the Faculty of Associated Medical Sciences, Chiang Mai University, Thailand (AMSEC- 61EX-008). There were two phases, with the first being development of the HI system that comprised two steps, i.e., (a) designing program contents and (b) developing the HI system. Indeed, before developing the HI system, its content and process was design by reviewing related literature (Naipat, 2005), expert examination and member checking. The second phase was an efficiency study of the HI system. In this phase, occupational therapists of the Chiang Mai Occupational Therapist Club were invited as care managers in their service communities to participate and investigate efficiency of the HI system.

Mean	Level of the efficiency
4.50-5.00	High
3.50-4.49	Good
2.50-3.49	Medium
1.50-2.49	Low
1.00-1.49	Very Low

Table 1 General information of the participants (n = 15)

3. RESULTS

3.1 Development of the HI System

The HI system was designed to have six parts such as log in, data display and summary, history, assessment, intervention and follow-up.

After the text edit has been completed, the paper is ready for the template. Duplicate the template file by using the Save As command. In this newly created file, highlight all of the contents and import your prepared text file. You are now ready to style your paper.

The log in part is shown on the first page of the HI system. It comprises the name of the system, user ID box and password box.

The data display and summary part shows the result of developmental screening, personal data and client status. In general, occupational therapists have the responsibility as care managers to screen the development of children in the community. The type of screening tool in this study depended on the birth weight. Children who had a low (<2,500 grams) and normal (>2,500 grams) birth weight were screened for development by the Developmental Assessment for Intervention Manual (DAIM) and Developmental Surveillance and Promotion Manual (DSPM), respectively. However, some communities had no occupational therapists in the community hospitals.

Occupational therapists at the second and third level, in general and provincial hospitals or medical institutes, might be care managers in the community and use screening tools such as the DAIM and DSPM. Moreover, they were supposed to use the Thai Early Developmental Assessment for Intervention (TEDA4I) as a tool for helping preschool children with delayed development. For these reasons, the data display and summary part included results of the DAIM, DSPM and TEDA4I.

The history part comprised general and health history. General history included national ID, name, name of caregiver, nationality, address, record date, birth date, gender, health scheme, hospital number, age and health condition. The health history included medical history, pregnancy history of mother and developmental screening record. Users of the developmental screening record were able to search the results of screening in the year the children were screened. The results of screening showed developmental areas in which the children were delayed such as Gross Motor (GM), Fine Motor (FM), receptive language (RL), Expressive Language (EL) and Personal-Social (PS) development.

The assessment part showed the assessment tools that care managers were able to choose. These tools related to the developmental areas in which the

children were delayed. The lists of assessment tools in terms of GM were The Miller Assessment for Preschoolers (MAP), Vineland Adaptive Behavior Scales (VABS), Bruininks- Oseretsky Test of Motor Proficiency, Second Edition (BOT-2), Clinical Observation for Sensory Integration, Short Sensory Profile and Reflex Testing Chart. The lists of assessment tools in terms of FM were MAP, VABS, BOT-2, Developmental Test of Visual Perception, Second Edition (DTVP-2), Beery-Buktenica Developmental Test of Visual-Motor Integration, Sixth Edition (Beery-VMI), Motor-Free Visual Perception Test, Third Edition (MVPT-3), Dynamic Occupational Therapy Cognitive Assessment for Children (DOTCA-ch), Clinical Observation for Sensory Integration, Short Sensory Profile and Reflex Testing Chart. The lists of assessment tools in terms of RL were MAP, VABS, BOT-2, DTVP-2, Beery- VMI, MVPT-3, DOTCA-ch, Clinical Observation for Sensory Integration, Short Sensory Profile and Reflex Testing Chart. The lists of assessment tools in terms of EL were MAP, VABS, BOT-2, DTVP-2, Beery-VMI, MVPT-3, DOTCA-ch, Clinical Observation for Sensory Integration, Short Sensory Profile and Reflex Testing Chart. The lists of assessment tools in terms of PS were VABS, Short Sensory Profile and Reflex Testing Chart. The intervention part comprised the intervention program, service code of the ministry and service code of the hospital. The care managers were able to hoose the intervention program that suited the developmental problems of the children such as coordination and hand function training, oral-motor stimulation and training, perception and learning and pre-speech, sensorimotor component, sensory integration, BADL, IADL and preschool skill training.

4. DISCUSSION

HI for care managers of children from birth to 6 years of age in the community was designed in this study from literature reviews, expert advice and member checking. That is to say, the development of HI was considered under policies of the Ministry of Health and context of the management system of community hospitals that are at the primary care service level (SISTH, 2013). Also, it related to the current situation of community health systems.

Moreover, in designing the program, community-based practice was applied with adapted MoHO, which is the service practice and model for analyzing the internal and external needs for encouraging community participation (Scaffa, 2001). Thus, the HI system was expected to improve work effectively for health service providers at primary care hospitals and increase the quality of life for children in the

community (SISTH, 2013; Yana and Sirapanitkul 2015). This issue related to Kaewyoo (2007), who found that the development of information systems by analyzing data in current situations was able to reduce the work process and increase work production more effectively. There is a tendency to use information systems in nursing to make work easier and be an important tool for the provision of health services, particularly in the health service area (Rimsuk, 2012).

In terms of efficiency, results of the prototype HI showed that it was at the good level after trialing the participants. This was because HI was developed for the needs of the users, who were occupational therapists working as care managers and having experience in providing services for children in the community. These care managers faced up to the problems of data overload and realized the usefulness of the HI system in improving the efficiency of health services in the public health system (SISTH, 2013). When considering each aspect of efficiency, the results found that usability was at the high level and had the highest mean. This was because the content of data recorded used general language and familiar technical terms of the health service. In addition, the data display was designed to be similar to that of the medical record system. Therefore, the participants noticed that the HI system was simple, easy to use and understandable. All of the other aspects were at the good to high levels. The HI program also provides security in accessing information by filling in a username and password before logging in. This process was checked the status and rights of the user. By setting up a user ID and unique password, the user would feel satisfied with the privacy and security of the data (Sunitsawan, 2012).

Furthermore, the function of recording who and when the individual client accesses the data might be added, which would increase data privacy and security of the HI system. Although the efficiency of the HI system were at the good level, the three lowest means were compatibility between the HI system and health service system, error of prevention and information alert management. This is because development of the HI system in community hospitals was at the primary care level, which is new in Thailand (Triviriyanupab et al., 2013) and the main health service system still does not support the hi-tech system. As seen some limitations, this HI system was studied within local areas, so that it was unable to be connected in between different areas and caring levels hospitals. Thus, complications in the main program of each hospital limited data alert management

between them. However, further study might reflect the results of this study to related policy makers and make them aware and support this system. When the HI system is made to be managed easily and more completely, it will bring about active use for the user (Eungwattana et al., 2015).

5. CONCLUSION

The HI system was developed in this study and comprised six parts including log in, data display and summary, history, assessment, intervention and followup. Efficiency of the prototype HI system was trialed and opinions were given from fifteen occupational therapists, who worked as care managers for children from birth to 6 years of age in the community. Most of the participants were female and aged 26-30 years old and had more than 4 years' experience of pediatrics in the community. Their perspectives indicated that efficiency of the HI system was at the good level. Furthermore, the usability aspect was at the high level. The results of this research could be reflected in order to push for a future community health policy that improves the community health service system. However, this research has the limitation of applying HI in different contexts, because the study was conducted in a specific area.

REFERENCES

1. Beck, R., V.J. Peel, D. Protti, A. Chairman and W.J. Towle, et al., 1998. Informatics and telematics in health: Present and potential uses. Switzerland.
2. Eungwattana, S., W. Teuanrat and W. Bunchiang, 2015. Development of a family health database of Public Health Nursing in Faculty of Nurse, Chiang Mai University. Chiang Mai University, Chiang Mai, Thailand.
3. HIS, 2015. Public health statistics A.D.2015: Bureau of policy and strategy. Health Information Section, Sam Charoen Commercial Co., Ltd, Bangkok, Thailand.
4. Hebda, T., P. Czar and C. Mascara, 2005. Handbook of Informatics for Nurses and Health Care Professionals. 3rd Edn., Prentice Hall, Upper Saddle River, NJ., ISBN-10: 0131512625, pp: 464.
5. Kaewyoo, V., 2007. Development of information system for research projects tracking. MSc Thesis, Chiang Mai University, Chiang Mai, Thailand.
6. Kuntawong, B., 2007. Development of a personnel health information technology system. MSc Thesis, Chiang Mai University, Chiang Mai, Thailand.
7. Naipat, A., 2005. Quantitative and qualitative research methods in behavioral science and social sciences. Samlada Partnership Limited, Bangkok, Thailand.
8. NICDF, 2011. Situations and concepts of children and youth. National Institute for Child Development and Family.
9. ONESDB, 2017. Summary of the 12th national economic and social development plan in 2017- 2021. Office of The National Economic and Social Development Board, Bangkok, Thailand.
10. Prasatkun, P., 2016. The situation of thai elderly in 2015. Amarin

Printing and Publishing Co., Ltd, Bangkok, Thailand Rimsuk, R., 2012. Development of a patient
11. classification database system for impatient unit. MSc Thesis, Chiang Mai University, Chiang Mai, Thailand.
12. Scaffa, M. and S.M. Reitz, 2014. Occupational Therapy Community-Based Practice Settings. 2nd Edn., F.A. Davis, Philadelphia, USA. ISBN-13: 0803640730, pp: 478.
13. Scaffa, M., 2001. Occupational Therapy in Community- Based Practice Setting. 2nd Edn., F.A. Davis, Philadelphia, USA. ISBN-10: 0803605595, pp: 414.
14. Schaper, L.K. and G.P. Pervan, 2007. ICT and OTs: A model of information and communication technology acceptance and utilisation by occupational therapists. Int. J. Med. Informat., 76: S212-S221. DOI: 10.1016/j.ijmedinf.2006.05.028
15. Solomon, J. and J. Obrien, 2011. Pediatric Skills for Occupational Therapy Assistants. 3rd Edn., Elsevier/Mosby, St. Louis, Mo., ISBN: 0323059104, pp: 630.
16. SISTH, 2013. Thai Health Information System. The Secretariat of the Senate. Subcommittee on Information Systems of Thai Health, Bangkok, Thailand.
17. Sunitsawan, M., 2012. An evaluation of information system usages. MSc Thesis, Chiang Mai University, Chiang Mai, Thailand.
18. Thiratsirikul, D. and K. Caefan, 2010. Health informatics. Triviriyanupab, P., P. Saengwongngam, A. Saengarun and K. Sripimanwat, 2013. World health information system survey to intelligent systems development, Thailand 2010. National Science and Technology Development Agency: Pathumthani, Thailand.
19. Ubonsuk, T., P. Wongthong and P. Rachata, 2013. Development of information system for student clubs. Rajamangala University of Technology Suvarnabhumi, Nonthaburi, Thailand.
20. Wungchanthanon, T., S. Watthamamorn, N. Buntumporn and N. Jirarattanawan, 2014. The role of caregivers of early childhood development centers in screening and promotion of child development. J. Sci. Technol., 12: 114-121.

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AN ADVANCED EMBEDDED SYSTEM FOR WOMEN SAFETY BY USING GSM AND GPS

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ABSTRACT:

The world is becoming unsafe for women in all aspects. The crime against women is increasing at a higher rate. The employed women are feeling unsafe due to increasing crimes. This paper proposes a quick responding mechanism that helps women during trouble. When someone is going to harass, she can just press the button and the location information is sent as an SMS alert to few pre-defined numbers in terms of latitude and longitude. The controller used is ARDUNIO UNO. It is interfaced with a push button, a GPS module, a GSM modem and a LCD Display (16×2). If the switch is pressed, the controller takes the current location information from the GPS module and sends those data to the predefined no. using a GSM modem. The program is developed in 'C' language. The purpose of this project is to feel safe the women's. Here we are using MEMS technology to easily find out the position of the women's. In case any unwanted position then to easily inform and location will send to authority peoples with help of GSM MODULE.

Keywords: GSM, GPS, Switch, LCD.

1. INTRODUCTION:

Even the common man's conversation on the streets often steers towards the escalated and horrendous attacks on women. An overbearing concern each of us has towards the women in our families has lent a sense of urgency to our dialogue on the critical and pressing issue of women's safety. Many special devices are primarily western and most of them have not reached India yet. Another issue is the high cost of manufacturing these devices. To make applications efficient, they would require GPRS services which might not be feasible. Applications get hanged, which lowers down the response time. These applications consume too much of battery power. Most of the applications available in the market do not work without the Internet or mobile network. This is exactly where the government needs to step in and try and mitigate cost and infrastructure issues for the corporations working in this direction The problem with apps is that they tend to be clumsy. The women have to open her phone, unlock it, open the app and then press a button. Also, most of the times, the perpetrators usually go for the phone first. The need is to develop independent devices like safety bands, rings, key rings etc. that can be carried around in disguise and used faster, and which will allow the women to send emergency messages with

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their location in times of distress. The device called as "Virtual Friend" is especially designed for the women in trouble. It is a device used for the women in chaotic situation. The basic approach is to use the Arduino Uno microcontroller based on ATmega328P has the function of send and receive data which is provided by Arduino GSM shield using GSM network. The current location of the victim is identified by the GSM network using Arduino Uno by initiating the user's smart phone. At once the Arduino Uno gets the coordinates of the current location the Arduino transfers the coordinate details to the user's smart phone via Arduino GSM shield. The SOS light is a signal used to alert the passerby and it gives the sign of universal help to the victim who are in distress. The alarm buzzer is activated if the woman is in danger situation. In the critical situation the women send the message or make a call including the location of the particular incident to the registered contacts through the use of GSM and GPS. Even if the device is thrown away it sends the message and making a call to the registered emergency contacts until they picked up or open the message.

OVER VIEW:

India which sees itself as a promising super power and an economic hub can achieve its goal if and only if a large numbers of women participate in the development process. This paper presents an examination review on the primary need of intelligence security system with technology requirement and experiments to build the system. Since the prediction of such incident is not possible hence to minimize the possibility of physical violence (robbery, sexual assault etc.) by keeping all the help tools ready to safely escape from violent situation. This reduces risk and brings assistance when needed. The social networking is the part of our life and also a source for women harassment by uploading the offensive photograph taken by hidden cameras, even though these cases might happen with innocence males, in some such cases these guys end their life by committing a suicide. The de facto spokesperson of United Nation Ban Ki-Moon, stated that there is one universal truth applicable to all countries, cultures and communities: violence against women is never acceptable, never excusable, and never tolerable [1]. The report of WHO states that, a violence act against female gender disturbed the public health life of society and also it violates the human rights of women [2]. The status of women in India has gone through many inordinate changes over the past few millennia. In modern India, women endure to face social challenges and are frequently victims of abuse and violent crimes and, according to a global survey conducted by Thomson Reuters, India is the fourth most hazardous country in the world for women, and the vilest country for women among the G20 countries. This paper focuses on a security system that is designed exclusively to serve the purpose of providing security and care to women so that they never feel helpless while facing such social challenges. The Delhi Nirbhaya case that prompted the whole nation was the utmost motivation for this paper. It was high time we women needed a change [3]. The suggested device is more like a safety system in case of emergency. This device can be tailored in a jacket (like to a blazer for women). It is comfort and easy to carry device with more features and functions. The emergency push button is held to one of the buttons in the jacket. The main purpose of our invention is to intimate the parents and police about the current location of the women by message through GSM. A GPS system is used to track the current location of the victim and a GSM modem is used to send the message to the

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predefined numbers. There are numerous applications that reduces the risk of sexual abuse by sending SMS but in our model we also provide an audio circuit which is more useful for physically challenged people. In this paper section 2 represents the certain analysis of the existing system, section 3 describes the proposed method of GSM based women's security system and section 4 describes the results and implementation and section 5 represents the conclusion of our proposed methodology.

When women are travelling or doing any outdoor activities and if unfortunately they go through these problems and to avoid these crimes to be faced they pronounce or rather say speak keywords which will give a signal to android but this can also give suspicion to the criminal and then he/she will throw victim's android.

A. Challenges faced By Women

The world is becoming less safer for women as they have to deal with major problems like sexual harassment, domestic violence, rape etc. Rapists and molesters still continue to commit such crimes even though in presence of strict laws and armed forces. The crimes are increasing in India as it was 195,856 in year 2008 and went up to 244,270 in 2012. Not only India but the most developed country on Earth also faces these problems in America 232,960 women were allegedly raped or sexually assaulted in the year 2006.

B. Solution with the Help of Technology

Many apps have been developed by developers to solve these problems but due to lack of features these problems are still unsolved and our eyes can read the headline of newspaper saying "Rape." When women are travelling or doing any outdoor activities and if unfortunately they go through these problems and to avoid these crimes women can use this system and reduce their problems. Ensures the safety of women as it sends the location of the woman also it does dens the photo of the criminal. Also in India 30% of women can access the internet easily.

2. LITERATURE SURVEY

Abhijeet Mane , Manoj Gharge , Omkar Pol, They are explain Nowadays women are facing many problems like rape, molestation, kidnapping etc. This uniquely designed system will help to reduce crime rates against women. It has been prioritized to give security to women especially to the women in urban areas as they can face problems while travelling the system is not so expensive thus many women can benefit themselves. In this system there are many components like LEDS, buzzer, shock generator etc. When a woman finds herself in a wrong situation she will instruct the machine so that it can send messages to known five people with her location and the message is immediately sent without any problems. The hardware components are maintained so that there will not be an error also there is a power supply present in it a battery of high quality has been used this system will easily help a woman out to escape from this dangerous situation as it will smartly give GPS means location of a woman and then any known ones of the woman can rush at the location and help her.

C. Priya, Ramya C, Befy D, Harini G, They are proposed In our country, it has rule and financial betterment, but still there are many abuse against women. These activities can be terminated with the beneficence of mentioned product. This device is used for defense system, especially designed for women in hardship. Method/Analysis: The hardware device used for this is ARM controller. It is

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the most productive system and it use up very less power. Application / Improvement: Above mentioned ARM controller is used for tracking mechanism. Tracking mechanism which is called GPS is connected to ARM controller. The capacitive sensor need to be pressed for fraction milliseconds to alert locate, and can send emergency message to the emergency contacts with intent location and the buzzer will alert to nearby people for help, then the tear gas will be released after the touching sensor is touched .Thus the victims can have enough time to escape from stranger using our application.

R Anitha, Explain It is an accepted fact that brutal crimes against women are occurring in India daily. Now many Indians do not deny or shy away from conversations relating to eve-teasing, sexual assaults or rape. Even the common man's conversation on the streets often steers towards the escalated and horrendous attacks on women. The device called as "Virtual Friend" is specially designed for the women in trouble. It is a device used for the women in a chaotic situation. The basic approach is to use the Arduino Uno microcontroller based on ATmega328P has the function of send and receive data which is provided by Arduino GSM shield using GSM network. Arduino Uno gets the coordinates of the current location; it transfers the coordinate details to the user's smart phone via Arduino GSM shield. The SOS light is a signal used to alert the passerby and it gives the sign of universal help to the victim who is in distress. The alarm buzzer is activated if the woman is in danger situation. In the critical situation, the women send the message or make a call including the location of the particular incident to the registered contacts through the use of GSM and GPS.

K. Mohana prakash, Explain detailed about a smart alarm system for women's security. Women all over the world are facing much unscrupulous physical irritation. This acquires a fast pace due to lack of a suitable investigation system. The system look like a group on the wrist merged with pressure switch as an input which when triggers shows the result loud alarm imposed for self-defensing purpose and send location and messages to the emergency contacts. The whole process will be held in Arduino Microcontroller. The digital switch incorporates with the controlling unit. Whenever the user presses the digital switch, the emergency message will be passed to the server unit via GSM SIM 800A module. By implementing the proposed system, the physical harassment on the women will be reduced.

Gowri Predeba. B, Explain in the current global scenario, the prime question in every girl's mind, taking into account the ever rising increase of issues on women harassment in recent past, is only about her safety and security. The only thought haunting every girl is when they will be able to move freely on the streets even in odd hours without worrying about their security. This paper suggests a new perspective to use technology to protect women. The system resembles a normal cloves which when activated, tracks the location of the victim using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to three emergency contacts and the police control room. The system also incorporates a screaming alarm that uses real time clock, to call out for help and also generates an electric shock to injure the attacker for self defence.

3. METHODOLOGY

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The whole implementation held in Arduino microcontroller and arduino programming takes as software implementation tool. The user press the emergency switch, the GSM SIM800A automatically passes the SMS to the Server unit. The following Fig. 3 shows the hardware implementation of our proposed methodology. The message transferred from GSM SIM800A to the Server unit was shown in Fig. The message transferred from GSM SIM800A to the Server unit was shown in Fig. The Sim inserted to the GSM SIM800A is used to find the users location and prevent the user.

In this system there are many components like LEDS, buzzer, shock generator etc. When a woman finds herself in a wrong situation she will instruct the machine so that it can send messages to known five people with her location and the message is immediately sent without any problems. The hardware components are maintained so that there will not be an error also there is a power supply present in it a battery of high quality has been used this system will easily help a woman out to escape from this dangerous situation as it will smartly give GPS means location of a woman and then any known ones of the woman can rush at the location and help her.

OPERATION WITH RESULTS:

The basic principle used for security system is prevention and communication by Using GPS, GSM technology. It consists of Arduino, Touch sensor, Buzzer, GPS and GSM technology. Arduino UNO is used to control the overall process. The Arduino is programmed by mean of C languages and then compiled and stored in the flash memory. It has everything needed to support the microcontroller; simply connect it to a computer with a battery to get started it with an AC-to-DC adapter. The user can tinker with the UNO without concerned more around doing something bad, worst case scenario you can replace the chip and start over again. The touch-sensing IC TTP223B is built by capacitive touch sensor. In the groundless state, the output of the module remains at 0(low0). When the finger is touched on the sensor, the output of the module goes high (1).If the finger is not touched for 12 seconds, switches to low- power mode. Module can be installed on ductile, reflector or non-metallic material. The piezo buzzer produces the sound based on contra of the piezoelectric effect. The buzzer produces a some riotous sound for voltage variation applied to it. It consists of piezo crystals between two conductors. When a potential is applied across these crystals, they pull on one conductor and push on the other. This push and pull action, results in a second wave. KHz More buzzer produce sound in the range of 2-4KHz. A GSM module is basically a GSM modem (like SIM 900) Connected to a PCB with different type of output taken from the board – say TTL output (for the Arduino controller 8051 and other controllers) and provisions. GPS Module continuously receives the data from the satellite and transmits correspondingly to the RS232.

RESULTS:

This project illustrates the safety of women. To deal with the problem of security issues of women the circuit is designed so that women feel safe while going alone at night. This project gives self dependence to women by giving shock by shock generator to the attackers. And by GPS receiver we can find the position of women in the form latitude and longitude.

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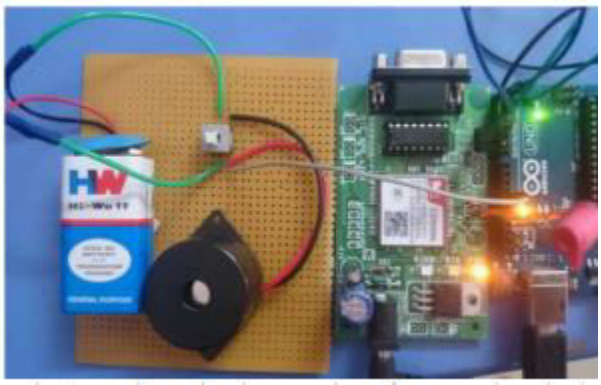
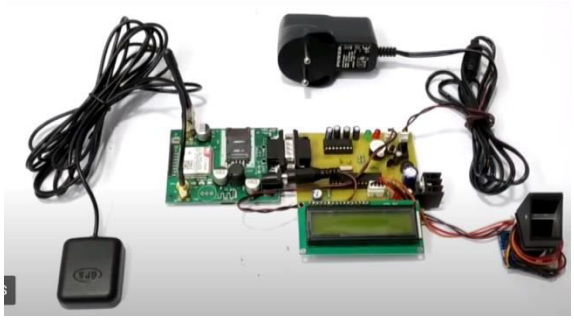


Fig. GSM MODULE

Women wear cloves, if somebody try to attack her heavy force is exerted on her. The force sensor senses force on the women continuously. When heavy force is applied on her by attacker it sense the force more than the threshold level it sends signal to the controller. The metal detector also senses for the presence of metal like knife and etc. suddenly the controller applies electric shock on the attacker through the electric shock system and alarm is raised for help. The location is tracked by the GPS module. The location and HELP message is sent to the contacts that we have stored in our system through GSM module. So women can be saved from the attackers.



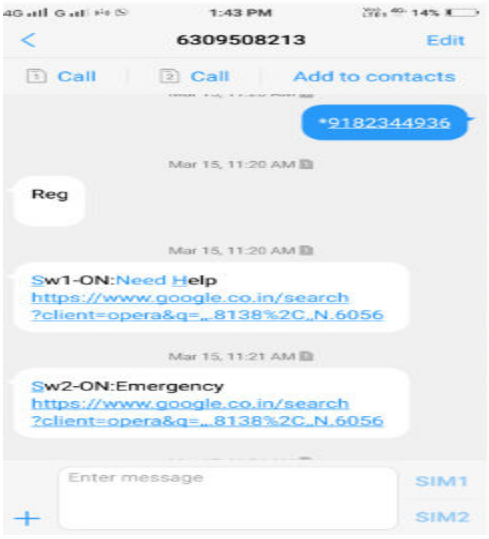


Fig. Final OUTPUT results with location.

CONCLUSION

In this research an intelligent and sophisticated Women safety is implemented and tested. The results show that the system ensures complete women safety during public transport. And system provides self defence to the women by giving shock to the attackers. We successfully implemented the system and acquired the desired output. The intelligent security system women has been developed with such a motivation that the women are provide with safe environment under all circumstances. Our primary goal is to safeguard every woman in our society to feel safe and secured. The paper would aid in enhancing the safety and security of all despondent and badgered women and children. This we believe would help not only one to feel secured but also help the law enforcing authorities to bring the masquerading culprits to light. This paper is a step closer for us to improve our social security.

REFERANC[1] Andrea Z and Lorenzo V., "Internet of Things for Smart Cities," IEEE

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 12, S Iss 1, Jan 2023

Internet of Things Journal, vol/issue: 1(1), Feb 2014.

[2] Isna K. and S. D. Sawant, "Integration of Cloud Computing and Internet of Things," International Journal of Advanced Research in Computer and Communication Engineering, vol/issue: 5(4), Apr 2016.

[3] Sonali D. T., "Cloud Computing and Software-Based Internet of Things," International Journal of Advanced Research in Computer Science and Software Engineering, vol/issue: 6(4), Apr 2014.

[4] Jonathan K., "Using Active Queue Management to Assist IOT Application Flows in Home Broad band Networks," 2017 IEEE Internet of Things Journal, vol/issue: 4(5), Oct 2017.

[5] Pengfie Z., et al., "Secure Location of Things(SLOT) : Mitigating Local Spoofing Attacks in Internet of Things," IEEE Internet of Things Journal, vol. 4, Dec 2017.

[6] Akriti S., et al., "Intelligent Accident Management System using IoT and Cloud Computing," 2nd International Conference on Next Generation Computing Technologies, Oct 2016.

[7] C. Chatrapathi and N. R. Venkatesakumar, "VANET based Integrated Framework for Smart Accident Management System," International Conference on Soft-Computing and Network Security, Feb 2015.

[8] Priyal R. and Vanthana S., "Car Accident Notification System based on Internet of Things," International Journal of Computer Applications, vol/issue: 107(17), Dec 2014.

[9] H. M. Ali and Z. S. Alwan, "Car Accident Detection and Notification System Using Smartphone," International Journal of Computer Science and Mobile Computing, vol/issue: 4(4), pp. 620-635, Apr 2015.

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IOT BASED VEHICLE ACCIDENT NOTIFICATION SYSTEM

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ABSTRACT:

The creation of generation has additionally improved the site visitor's dangers and the street accidents take region frequently which reasons huge lack of existence and property because of the bad emergency centres. The twist of fate detection venture will provide the very best exceptional way to this drawback. An accelerometer can be used in a car alarm software program simply so risky the usage of may be detected. It may be used as a crash or rollover detector of the automobile in the course of and after a crash. With signs from an ultrasonic sensor, an immoderate twist of fate due to an obstacle can be identified. When a vehicle meets with an accident or if a car rolls over, the accelerometer and ultrasonic sensor detects the sign and straight away sends it to the microcontroller. The microcontroller sends the alert message via the IOT module together with the region to police manage room or a rescue organization. So the emergency assist crew can immediately hint the area via the GPS module, after receiving the records. The area also can be seemed on Google maps. After confirming the location important action is taken. In this assignment, we're supplying an IoT based system if you need to assist drivers to power the automobile successfully and efficaciously. This device consists of tracking and finding the vicinity of the accident using GPS and communicates the coordinates thru SMS the use of onboard WIFI module.

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Keywords: WIFI, GPS, SMS, Accident, communication, Location, Internet of things.

1. INTRODUCTION

Major deaths arise due to the street injuries in all around the international. According to the brand new Surveys from IIHS it's far stated that these may be decreased with the aid of right implementation of the IOT systems and based totally mostly on notification structures additionally. It can handiest lessen the deaths after injuries however we cannot control the behaviours of the drivers consisting of alcohol using and drug-addicted humans force and so on. These behaviours cannot be controlled. Automatic detection of crashes is basically performed in numerous car industries including Tesla one of the leading example. The centre principle of the venture is to reduce the range deaths which induced due to lack of right remedy at the proper time. The proposed design is a tool that may discover injuries in significantly less time and sends the simple facts to first useful resource middle internal some seconds defensive geographical coordinates, the time and mind-set wherein a vehicle twist of fate had befallen. This alert message is sent to the rescue institution in a brief time, so one can help in saving the valuable lives. The transfer is likewise provided so one can terminate the sending of a message in a great case wherein there may be no casualty, this may store the valuable time of the medical rescue institution. When the coincidence takes place the alert message is sent robotically to the rescue crew and to the police station. The message is despatched through the IOT module and the place of the twist of fate is detected with the help of the GPS module. The twist of destiny can be detected precisely with the assist of accelerometer and ultrasonic sensor. The attitude of the rollover of the automobile cans also is diagnosed by using the accelerometer. This software affords

the perfect choice to horrible emergency centres furnished to the roads accidents inside the feasible manner.

2. RELATED STUDY

With the advent of technology and era in every stroll of lifestyles, the significance of car protection has extended and the principle priority is being given to decreasing the twist of fate detection time whilst a coincidence occurs really so the wounded lives may be attended in lesser time via manner of the rescue crew. The Microcontroller on the side of ultrasonic sensor, accelerometer, GPS and WIFI modules shorten the alarm time to a massive extent and find out the website of twist of destiny as it have to be. Consequently, the time for searching the region is reduced and the character may be handled as speedy as viable inside the way to preserve many lives. This system can also need to have large utility opportunities because it integrates the area structures and the network of scientific based totally sincerely services. In the present twist of destiny detection structures; there is the hassle of fake alarms or situations in which right now assist isn't essential. In such instances, the reason force has with a purpose to manually transfer off the alert device and prevent the sending of the message. The twist of fate avoidance gadget allows maintaining away from the normal injuries in an effort to usually upward push up on highways and in town site visitors. These accidents in particular happen thru distraction, unconsciousness, and distance unknown amongst our automobiles. So allow us to remember the Indian roads and we're able to have 2 ultrasonic sensors wherein one is positioned within the front and every other one in the back of the auto. Due to this sensor, we're able to calculate the gap between specific cars nearing us. Thus we're able to discover one of kind motors

and we are able to shield ourselves in competition to injuries.

3. AN OVERVIEW OF PROPOSED SYSTEM

The essential idea behind this mission is to keep away from ascendants. It is a precautionary measure that signals the riding pressure. The initial degree begins of advanced from the ultrasonic sensor that identifies the car within the back and front element. If the car reaches 10 meters, the green coloration slight will glow so that you can display the notification. At an eight-meter distance, the yellow colour mild will alert us. When it reaches five-meter distance pink colour slight will alert us we're in chance vicinity. At the same time, the space between one car and every other vehicle was displayed in LCD. Wire connections are made from the breadboard to the LCD. ARM kit to the ultrasonic sensors and subsequently breadboard to the ARM package. This challenge will make the clean calculation of a distance among one car and every other automobile for the purpose force. The aim of the machine is to create a smart twist of fate detection tool using that detects the prevalence of a twist of fate and sends a message to the site visitors manage government or emergency assist facilities in case of a twist of destiny in order that instantaneous help may be provided. It additionally lets in actual-time tracking of car's location through SMS. The gadget has a transfer to allow the reason pressure to stop alert machine in case of fake alarms. This device acts as a black area to automobiles. The automobile's vicinity may be regarded the usage of Google maps which may be a bargain simpler than the vicinity in terms of latitude and longitude. GPS - Global Positioning System Module is used in cars for each tracking and navigation. Tracking systems enable a base station to keep the track of the automobiles without the intervention of the using force wherein, as

navigation device enables the motive pressure to reach the destination. Whether navigation device or tracking device, the shape is greater or tons much less comparable. When a twist of fate passed off in any place then GPS tool tracks the position of the car and sends the facts to the specific person via WIFI via alerting the man or woman thru SMS or by using a name. As a further desire, the location detection may be achieved the use of Google maps interface.

Fig.3.1. Working model.

4. CONCLUSION

Vehicular Accidents has usually been a high-quality catastrophe since the inception of Transport System, Statistics indicates a big quantity of harmless lives claimed with the aid of using means of these accidents and Vehicular accidents have seen a surge in today's years, development of generation may be used to put in safety system. This device is a step within the direction of comfortable riding of motors, it makes use of reasonably-priced and reliable ARM as number one controlling board and is interfaced with sensors for impediment detection, Alcohol consumption detection, and accelerometer for coincidence detection and board uses data from those sensors to determine emergency conditions and may ask for help the usage of WIFI module with coordinates from GPS module. And additionally, tool additionally makes use of many logical sensors because of unavailability or due to rate-effectiveness.

REFERENCES

[1] D. B. Tushara and P. A. H. Vardhini, "Wireless vehicle alert and collision prevention machine layout using Atmel microcontroller," 2016 International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT), Chennai, 2016.

[2] S. Lee, G. Tewolde and J. Kwon, "Design and implementation of vehicle monitoring gadget the use

of GPS/GSM/GPRS technology and smartphone software," 2014 IEEE World Forum on Internet of Things (WF-IoT), Seoul, 2014.

[3] Salas K Jose., X. Anitha Mary., Namitha Mathew "Arm 7 Based Accident Alert and Vehicle Tracking System", International Journal of Innovative Technology and Exploring Engineering (IJITEE)

[4] Jorge Z., Carlos T. , Juan C. And Pietro M., "Providing Accident Detection in Vehicular Networks thru OBDII Devices and Android-based totally Smartphones", Proceedings of the IEEE thirty sixth Conference on Local Computer Networks, Washington, DC, USA, PP. 813-819,October 2011.

[5] TANG shuming, GONG xiaoyan, WANG feiyue, senior member, IEEE "Traffic Incident Detection Algorithm Based on Non-parameter Regression" ITSC 2002 , 0- 7803- 7389- eight/02/$17.00 CJ 2002 IEEE.

[6] Hu Rufua, Li Chuanzhia, He Jieb, Hang Wenb and Tao Xianglib "Study on the Method of Freeway Incident Detection Using wireless Positioning Terminal" ICICTA on 20-22 Oct. 2008 in hunan, 978-zero-7695- 3357-five/08 $25.00 © 2008 IEEE.

[7] Sri Krishna Chaitanya Varma, Poornesh, Tarun Varma, Harsha, "Automatic Vehicle Accident Detection And Messaging System Using GPS and GSM Modems", International Journal of Scientific & Engineering Research, Volume 4, Issue 8, August 2013.

[8] Apurva Mane, Jaideep Rana, "Vehicle Collision detection and Remote Alarm Device using Arduino", International Journal of Current Engineering and Technology, Vol.Four, No.3, June 2014.

[9] Prof.Mrs.Bhagya Lakshmi V, Prof.Savitha Hiremath, Prof.Sanjeev Mhamane, "FPGA Based Vehicle Tracking and Accident Warning using GPS", International Journal of Scientific & Engineering Research, Volume 5, Issue 2, February-2014.

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SENSOR DATA LOGGER SYSTEM BY USING IOT

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ABSTRACT:

The system proposed in this paper is an advanced solution for monitoring the weather conditions at a particular place and make the information visible anywhere in the world. The technology behind this is Internet of Things (IoT), which is an advanced and efficient solution for connecting the things to the internet and to connect the entire world of things in a network. Here things might be whatever like electronic gadgets, sensors and automotive electronic equipment. The system deals with monitoring and controlling the environmental conditions like temperature, relative humidity, light intensity and CO2 level with sensors and sends the information to the web page and then plot the sensor data as graphical statistics. The data updated from the implemented system can be accessible in the internet from anywhere in the world.

Keywords: Temperature sensor, Humidity, wifi module, BUZZER.

1. INTRODUCTION:

The importance of weather monitoring is existed in many aspects. The weather conditions are required to be monitored to maintain the healthy growth in crops and to ensure the safe working environment in industries, etc. Due to technological growth, the process of reading the environmental parameters became easier compared to the past days. The sensors are the miniaturized electronic devices used to measure the physical and

environmental parameters. By using the sensors for monitoring the weather conditions, the results will be accurate and the entire system will be faster and less power consuming. The system proposed in this paper describes the implemented flow of the weather monitoring station. It includes the wireless communication technology IEEE 802.11 b/g which is also familiar as Wi-Fi in general terms. The system monitors the weather conditions and updates the information to the web page. The reason behind sending the data to the web page is to maintain the weather conditions of a particular place can be known anywhere in the world. The system consists of temperature sensor, Co2 sensor, Humidity sensor and light dependent resistor. All this sensors can measure the corresponding weather parameter. The system is intended to use in large residential buildings and manufacturing industries. The system is including with a microcontroller to process all the operations of the sensors and other peripherals. The wireless communication standard was chosen in our system by analysing the requirements of the application, that the weather conditions should be monitored and updated all the time continuously. There are many local area network standards for communication, but they are all standalone communication processes and completely localized communication. In our application, we have to make the weather condition of a particular place can be informative anywhere worldwide. The other communication technologies like ZigBee, RF Link can make the communication nearly in the same range of Wi-Fi but they can‟t broadcast the information as they can only communicate peer to peer. The World Wide Web (www) needs to have one client – server configuration

for communication. It client needs to be connected to the server with its IP address which can be universally accessible. The system is equipped with all sensor devices should acts as client to send the data to the web server. For establishing a connection between the sensor network and internet, we used a Wi-Fi module as an additional communication interface controlled by the microcontroller. A Wi-Fi module requires a source of wireless internet connection. Once configuring the Wi-Fi module with an internet source, it acts as client and sends the sensor data retrieved by the microcontroller. The criteria of connecting all the sensors to the internet is Internet of Things (IoT). The concept of connecting the electronic devices, sensors, and automobile equipment together via internet.

2. PREVIOUS STUDY:

The importance of weather monitoring is existed in many aspects. The weather conditions are required to be monitored to maintain the healthy growth in crops and to ensure the safe working environment in industries, etc. Due to technological growth, the process of reading the environmental parameters became easier compared to the past days. The sensors are the miniaturized electronic devices used to measure the physical and environmental parameters. By using the sensors for monitoring the weather conditions, the results will be accurate and the entire system will be faster and less power consuming. The system proposed in this paper describes the implemented flow of the weather monitoring station. It includes the wireless communication technology IEEE 802.11 b/g which is also familiar as WiFi in general terms. The system monitors the weather conditions and updates the information to the web

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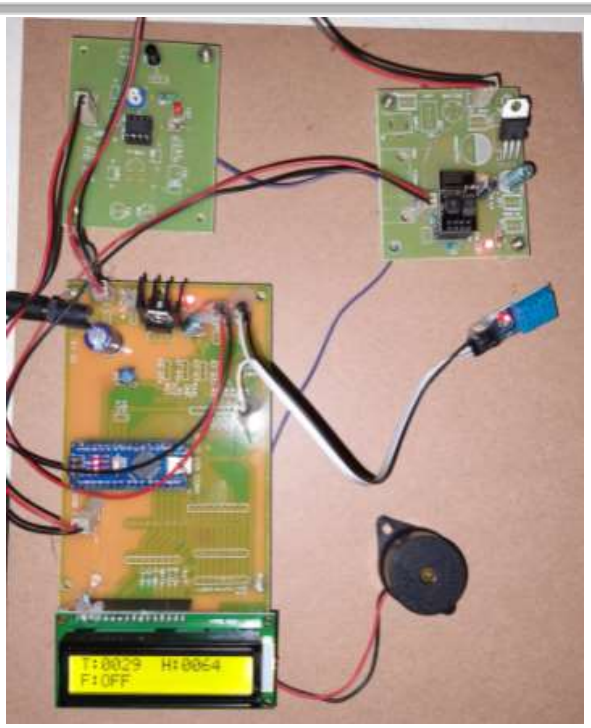
configuring the Wi-Fi module with an internet source, it acts as client and sends the sensor data retrieved by the microcontroller. The criteria of connecting all the sensors to the internet is Internet of Things (IoT). The concept of connecting the electronic devices, sensors, and automobile equipment together via internet.

3. PROPOSED SYSTEM:

In the proposed system, the software implementation plays a major role while retrieving the sensor data and updating it to the server. Here two software tools we used mainly. They are, Keil uVision Ide and Flash Magic. The Keil uVision IDE is an embedded programming platform which supports various microcontrollers and provides a complete programming environment for the microcontrollers. We used this IDE for programming the LPC2148 which is a microcontroller with ARM7 TDMI processor. Flash magic is a tool used for writing the machine language code into the microcontroller‟s flash memory. This tool also facilitates the additional features like terminal window for the hardware devices. The entire programming part of the system can be done in C language. Firstly, we have to initialize the ESP8266 by sending a few AT commands. Initialization process includes, checking the communication with ESP8266 to microcontroller, searching for a Wi-Fi network within its range and connecting the Wi-Fi module to that network by getting authenticated with required credentials. After the initialization process, we have to program for configuring the Wi-Fi module as a TCP/IP client. While configuring the ESP8266, checking the acknowledgment is important to ensure that the module is configured correctly. After configuring the ESP8266, we have to program for reading the sensor data. The ADC

(Analog to Digital Converter) unit should configured with all prerequisites like clock frequency, resolution and data format. Then the microcontroller will run the instruction continuously to get the updated data values from sensors. Now the major task has arrived in discussion, i.e. plotting the sensor data in a graphical form. Here we need to go through some kind of a networking environment, where we need to deal with IP address communication. As we mentioned in the earlier chapters, we used one open source data logger web site to make reduce the implementation cost. In a normal way, if we want to plot the data into web site, we have to own and pay for the domain space and design the web page as per our requirements, which is complex and costlier method. Instead of paying for a own domain, we used one web site called “Thingspeak”. It provides a free user space for creating the data channels. Each channel will be having 8 fields to write the various data and it automatically plots the given data in a graphical representation. The communication with Thingspeak server can be done by using its IP address. We have to program for ESP8266 to send the required AT commands and to establish a connection between the system and thingspeak server. Once we created once channel for entering the data into web site, the channel will be allocated with one API key. So we have to write the API key before writing the actual data, then the data will be stored and displayed in the required channel. The following pictures shows the example plot of temperature and light intensity showing in the channels.



4. CONCLUSION:

The research and implementation of a system for monitoring the environmental parameters using IoT scenario is accomplished. The system provides a low power solution for establishing a weather station. The system is tested in an indoor environment and it is successfully updated the weather conditions from sensor data. It is also a less expensive solution due to usage of low power wireless sensors and SoC contained Wi-Fi module.

REFERENCES:

1. Xiaojing, Z., Yuangua, L., Zigbee implementation in intelligent agriculture based on internet of things, College of Electronics Information and engineering, Qiongzhou University, China, 2012

2. Adinarayana, J., Huh, E., Wan, Y and Kiura, T., Becoming technological advanced - IOT applications in smart agriculture

3. Agarwal, R. and Karahanna, E. Time flies when you're having fun:Cognitive absorption and beliefs about information technology usage, MIS Quarterly, vol. 24, no. 4, pp. 665-694, 2000.

4. Agriculture, livestock and fisheries: sector profile,http://www.zda.org.zm/content/agriculture

5. AgriSETA, Sector Analysis agriculture, Department of Higher Education and Training, South Africa, 2010.

6. S. R. Nandurkar, V. R. Thool, R. C. Thool, "Design and Development of Precision Agriculture System Using Wireless Sensor Network", IEEE International Conference on Automation, Control, Energy and Systems (ACES), 2014.

7. JoaquínGutiérrez, Juan Francisco Villa-Medina, Alejandra Nieto-Garibay, and Miguel Ángel PortaGándara, "Automated Irrigation System Using a Wireless Sensor Network and GPRS Module",IEEE TRANSACTIONS INSTRUMENTATION AND MEASUREMENT, 0018-9456 , 2013

8. Dr. V .Vidya Devi,G. Meena Kumari, "Real-Time Automation and Monitoring System for Modernized Agriculture" ,International Journal of Review and Research in Applied Sciences and Engineering (IJRRASE) Vol3 No.1. PP 7-12, 2013

9. Y. Kim, R. Evans and W. Iversen, "Remote Sensing and Control of an Irrigation System Using a Distributed Wireless Sensor Network", IEEE Transactions on Instrumentation and Measurement, pp. 1379–1387, 2008.

10. Hemlata Sahu, Shalini Sharma, Seema Gondhalkar, "A Brief Overview on Data Mining Survey", International Journal of Computer Technology and Electronics Engineering (IJCTEE), Volume 1, Issue 3.

11. D Ramesh, B. Vishnu Vardhan, "Data Mining Techniques and Applications to Agricultural Yield Data", International Journal of Advanced Research in Computer and Communication Engineering, Vol. 2, Issue 9, September 2013.

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WIFI CONTROLLED ROBOTICS USING ESP8266 AND ARDUINO

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ABSTRACT:

The aim of the project is to provide a new or modified system in the area of surveillance which is very mandatory in many areas around the world. It can be used in all the areas where surveillance comes into a major aspect. Thus the project functions as a very efficient way for surveillance by providing a video output to the controller and avoiding obstacles automatically. The software used here is Arduino compatible C and the hardware used is TELNET, ATmega 328 board and Ethernet board.

Keywords: DC Motor, TELNET, IOT.

1. INTRODUCTION:

Surveillance is very much mandatory in today's rushing world. A sense of protection is achieved through surveillance. Thus, it is a very tedious process for a person to cover the entire area under surveillance. Hence the idea of automation plays a major role. The robots are very useful in this operation. This also reduces labor cost and covers a large area with a comparatively lesser time. This wireless controlled robot is very efficient in this process. The output is achieved with ease by the controller. The components used are very much useful for performing the surveillance operation. The SPduino ATmega328 controller board is a

microcontroller board based on the ATmega328P (datasheet). Servo shield is used to power the PWM chip and determines the I2C logic level and the PWM signal logic level. The IR Sensor is used to sense any kind of obstacle on the robot's way. The Ethernet board used here is very essential for the Arduino board to be connected to the internet. The wireless camera that we have used is used to transmit the video signals to the user at the control end for better efficiency in controlling. The Servo motor used is used for fixing the camera as it provides the motion in both the X and Y direction. The servo motor controller is used for controlling the servo motor and the command for direction flows through this to the servo motor. The advantage in this project is that we have used the concept of IOT (Internet of Things). Because of this it can be controlled even with a smart phone connected to the same network as the robot. This is achieved as said by the Ethernet board which connects the Arduino board to the internet. Due to these advantages one can take control of the robot from any distance and can receive the data from the robot instantly. As the size of the robot is small it can be operated with ease in a very narrow and crooked pathways and places that humans cannot enter and also avoids the obstacles automatically as human errors are unpredictable and the robot can be saved from damage. Even though there are many techniques in surveillance, as the use of smart phones is major among the people around the world, this technique will be successful in the area of surveillance

2. PREVIOUS STUDY:

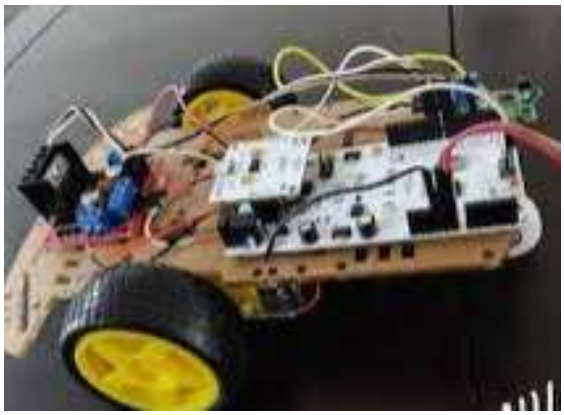
Now a day the high standards of living have encouraged automation to come on the van and be an integral part of home design. At the same time, the

environmental relation has ensured that energy-efficient housing models and appliances are used. So, we proposed the system called homey, a robot which can do tasks on behalf of a person at home. Our project aim is to develop a robot which can recognize the voice and perform tasks according to the command. It can be controlled manually remotely by android smart phone application or any internet enabled device through internet. So that it can be used by anyone and specially can be helpful for physically disable persons. IoT is the concept which creates a relationship between user and system remotely. It also creates interconnection between devices. There is three C's on IoT Communication, Control and Automation and Cost Savings [1]. We have tried to implement IoT so that user can control, communicate with the robot within a low budget. The user also can observe the environmental condition by using sensors. To connect with the internet, Wi-Fi Module with its low-cost effectiveness can be very useful and easy to use. Through internet a user can control the robot and its action remotely [2]. In 2017, J. Chandramohan, R. Nagarajan, K. Satheeshkumar, N. Ajithkumar, P. A. Gopinath and S. Ranjithkumar have worked with ESP8266 Wi-Fi module [3]. They have worked with Arduino UNO and ESP8266 Wi-Fi Module to control home appliance remotely. The user can control it without internet but using voice command [4]. There is a voice recognition system attached to the robot. There is a difference between recognizing voice and speech [5]. It depends on what type of recognition module and which algorithm will be implemented to the robot to recognize the voice of a user. The robot can only recognize voice, cannot differentiate the users. In 2015, K. Kannan and J. Selvakumar have

worked on ARDUINO BASED VOICE CONTROLLED ROBOT in India. They have used EasyVR Module as voice recognizer device [6]. They have also used Arduino mega 2560 as microcontroller

3. PROPOSED SYSTEM:

The robot can be controlled by android application as figure 2 through internet using Wi-Fi module. While user press any button on the application, corresponding commands are sent via internet to the robot. The commands are in the form of ASCII character. The Arduino on the robot then compare the received command with its pre-defined commands and control the servo motors, gear motors, sensors and other peripherals to move forward, backward, left, right, stop, move hands, fingers or measuring sensor values. The temperature button send command to Arduino to check temperature sensor value and the value is sent back to the user. Temperature value also displayed on the liquid crystal display attached on the front side of the robot. If the user presses the auto button or gets disconnected from internet the robot can move anonymously. During the anonymous mode sonar sensor helps it to avoid obstacle. The sonar sensor HC-05 helps to measure distance of the obstacle in front of the robot. The sonar sensor generates ultrasonic sound using trigger. Then it reads the echo Pin, returns the sound wave travel time in microseconds. The distance is calculated using the following rule.



The above pictures serve evident to the working of the model and its functionality. The following outcomes

were obtained as an output of the fabrication. The models movement was executed as designed. The video output was available to the operator and the control was made in a remote distance. The terrains on which the robot would perform were constrained to some factors.

4. CONCLUSION:

Thus this design and the execution of the model of the surveillance robot, controlled through IOT, will be considered as a extending leap in the area of surveillance. This will enhance the quality of the service provided in the area not accessible by the human beings. Thus this will ensure to provide success to all the areas involving surveillance. This robot can find its purpose in many fields, especially in areas of military operations, for the surveillance of foes' activities and the necessary preparations to handle it and providing the proper response to the situation. Future plans inclusive of reducing the size even more and providing the flexibility to access all kinds of terrains. This will increase the reliability and the accuracy of the data produced even more than the present model.

REFERENCES:

1. Gawli, K., Karande, P., Belose, P., Bhadirke, T., Bhargava, A.: Internet of Things (IoT) Based Robotic Arm. In: International Research Journal of Engineering and Technology, vol. 04, Issue. 03, India (2017)

2. Sehgal, T., More, S.: Home Automation using IoT and Mobile App. In: International Research Journal of Engineering and Technology, vol. 04, Issue: 02, India (2017)

3. Chandramohan. J., Nagarajan. R., Satheeshkumar. K., Ajithkumar. N., Gopinath. P.A., Ranjithkumar. S.: Intelligent Smart Home Automation and Security System Using Arduino and Wifi. In: International Journal of Engineering and Computer Science, vol. 6, Issue. 3, India (2017)

4. Kamdar, H., Karkera, R., Khanna, A., Kulkarni, P., Agrawal, S.: A Review on Home Automation Using Voice Recognition. In: International Research Journal of Engineering and Technology, vol. 4, Issue. 10, India (2017)

5. Street Directory, http://www.streetdirectory.com/travel_guide/139545/technology/ key_differences_between_speech_recognition_and_voice_recognition.html

6. Kannan, K., Selvakumar, J.: Arduino Based Voice Controlled Robot. In: International Research Journal of Engineering and Technology, vol. 02, Issue. 1, India (2015)

7. Serial Communication, https://www.arduino.cc/reference/en/language/ functions/communication/serial

8. components101, https://components101.com/l293d-pinout-features-datasheet 9. Dual H-bridge Motor Driver - L293D IC, http://www.robotplatform.com/howto/ L293/motor_driver_1.html.

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IOT BASED SMART IRRIGATION SYSTEM

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ABSTRACT:

The water resource for farming is very much important. In Olden days people used to supply water for irrigation through rivers, reservoirs, tanks, and wells for irrigation farming. Day by day some of such resources vanish and over the century, the population of India has become three times. Demand for food as growing population and the need for water for agricultural productivity is crucial. As a result of a severe shortage of water exists across parts of India. Though we have different solutions with which water and fertilizer utilization can be optimized still there are few gaps which need to be addressed to make the current systems more robust and backed by technology to get better yields. In this work, IoT based water conservation for farming using auomated drip irrigation system by considering scalability. Here for storing statics or parameters could storage is used. Based on these parameters dripping decisions (soil, moisture, and climate conditions) has been taken. The proposed solution is implemented and shown results with necessary parameter.

Keywords: Soil moisture sensor, Temperature sensor, IOT.

1. INTRODUCTION:

Water plays a key role in the world in each domain. The population is increasing exponentials series as water conservation is also become more and more. Water usage is high informing

fields. Many techniques are introduced to use water inefficient way for forming. As the world is entering new technologies, it's a mandatory or primary goal to trend up in agriculture [3[4] irrigation in India. Several kinds of research are tired of the sphere of agriculture. Most of the implementations came to signify the utilization of wireless sensing element in networks to collect the information from totally different sensors which are deployed at varied nodes and sends the sensing data through the wireless data transfer protocol. The obtained information from sensors gives knowledge regarding the assorted environmental and other influential factors. Watching those environmental parameter factors isn't the entire answer to extend the yield of crops to get better results. There is a range of different parameter factors that decrease outcome to a bigger extent. Thus, automation should be enforced in agriculture to overcome these issues. So, to supply an answer to any or all such issues, it is required to develop an Associate in a nursing integrated system which can watch out of all factors touching the outcome in each stage. However entire automation in agriculture isn't achieved and thanks to varied problems. Though it's enforced within the analysis level it's not given to the farming people as a product to urge advantages from such resources. Thus, this paper is to develop good agriculture based on IoT and given to the farming people. During this project, IoT technology helps in collection data regarding conditions like temperature, water-level, and wetness microcontroller [4][5][7]. IoT leverages farmers to urge connected to his farm from anyplace and anytime. Agricultural crop watching and management is done using Arduino Uno. Wireless sensing element networks are used for

watching the farm conditions and small management areas are accustomed to control and alter the farm processes.

2. PREVIOUS STUDY:

Agriculture plays a important role in all part of the India. Due to sudden change in climate and lower rainfall in all over India, the scope of agriculture become down. Without wasting the water, cultivation should yield maximum. In traditional method, the land get irrigated with excess amount of water than the crop needs. The wastage of excess water can be overcome by modern irrigation system such as drip irrigation, sprinkle irrigation etc. But this smart irrigation system can overcome the wastage of excess water through manual operation ie., offers a flawless operation in irrigating the land. The design and implementation of a clever irrigation gadget were broadly settled in different situations and most reliable price performance on the electric gadget. In reality, the clever irrigation device has extra benefits than the conventional techniques of irrigation. It uses helpful technology and assists the farmers, to irrigate and feed the crops with correct quantity of water and needed fertilizers to the crops. The implementation of a sensible irrigation system in a very land is simple and therefore the value to put in is additionally less. In this system we need of soil sensors, according to the size of the agriculture land. With the various soil sensors reading, the land can be irrigated equally by avoiding the problems like wastage of water and unequal irrigation. Equally irrigated land are monitored and controlled by remote operating system. The various mode of operations can be achieved through the android mobile application. It has microcontroller, and a bi-directional communication link. IoT plays a important role for the communicating

the system and farmers. The user interface is provided to them by the utilization of Android Mobile Application. The most contribution of this paper is to develop hardware and software for the farmer's irrigation system. The Proposed system of this paper is to eliminate the manual operation and to implement an entire automatic irrigation system. This system requires additional sensors with respect to the size of the farmer's land. By the implementation of this system, the farmers can able to know about their crops health in all seasons by login with their respective user id into the mobile app to check the status of their irrigation system. In case of power cut, the system can connect to a mini up because the system consumes only less power or once the power reconnects, the system will automatically connects to the Wi-Fi and starts operating automatically. The values from the sensors are sent to the microcontroller. The microcontroller will send this information to the cloud which is connected to the mobile app. After comparing the values with the reference values, the error signal is generated which is sent to the mobile app and the webpage. Through this, the farmers can check the status of the irrigation system remotely by proper checking the volume of water and quantity of fertilizers that are really required by the crops by utilizing this system, the farmers can yield a most quantity of product with low quantity of investment, water and fertilizers.

3. LITERATURE SURVEY:

This paper related work has done uniquely by two different ways, for example, one is physically and the alternate one is either mechanically or semi mechanically. The smart way systems embody IoT and the normal system. Name itself says IoT described project[1] has been introduced to irrigate the field by fully automatic by

using gsm. The GSM module is used to control the irrigation system by sending text messages and alert messages from the module for a flood control system. Then, it is overcome by [2] consists of a water flow level sensor which is used to measure and monitor the flow level of water in the drip irrigation pipe lines to minimize the excess of water by enhancing the plant growth. But for wheat and paddy fields always having excess of water in the field. Nitrogen in percolation water is used in paddy and wheat fields' soil to predict rice and wheat rotation. And another take a advantage for this one by detect a disease in nutrient growth and how far its growth rate [3] such other things will be same as that of[2]. Someone developed in more way as mobile app by integrated with IoT to monitor and controlling the irrigation [4].The system developed by [5] will not notify the required amount of fertilizer to the farmer. Mobile app is not provided for the framers for ease of use. The developed system [6] requires human power to irrigate the garden and it will not notify the farmer with proper notifications about the crops or plants. [7] has interfaced the sensors with the microcontroller with wireless communication. If the sensor disconnects due to power failure, again it cannot connect to the system automatically. In order to control the usage of water resources for irrigation, this [8] proposes the design of an automated organic irrigation system in controlling and properly allocating the available water resources for the irrigation system and available electricity for the use of the pump. It deals with the overview of the smart irrigation software development[9]. [10] Deals with the smart irrigation system with microcontroller is integrated with raspberry pi to transfer the data. It also deals with the smart irrigation system [11] with water

efficiency to reduce wastage of water.[12] Is also same but its disadvantage is fully manually controlled system. [13] Involves a wireless short distance mesh network to collect the sensor parameters to make a decision for the irrigation system development. The mesh network consists of Xbee module which is used to transfer data in the means of radio frequency. The Xbee in module provides only a short distance network transmission since there is no proficiency for satellite network system.The fuzzy logic is complicated than our system and this system requires more manual operations [14].Here the systems are connected with lan network so it requires long cables to transmit the data from the field to the controller. And this system will not notify or indicate any operation to the farmer [15].

4. PROPOSED SYSTEM

First, the system consists of following parts i.e. a microcontroller, relay, soil moisture sensor (LM393), I2C LCD display(16x2), Water pump and Water Level Sensor. A pipe is connected to the water pump in the water tank, which has a water level sensor attached to it, to check the amount of water left in the tank at every moment. The Water pump is connected to the Relay, operated on A.C supply, which turns ON/OFF as per the data sent by microcontroller by reading the moisture on the soil.

The moisture sensor is dipped under the ground near the plants. The sensor is always ON and senses the moisture content and sends the data to the controller which in exploits it to the LCD for displaying the data. Whenever the moisture content goes down, as per the crop farmer grows, the specified value; the Sprinkler starts to sprinkle the water to the field. We are using a servo motor to make a

Sprinkler to perform back and forth motion.

The controller used here is Arduino. Arduino is chosen as it is widely used for research purposes and different sensors and hardware are easy to interface. The soil moisture/humidity sensor uses 0.4 mA of current so chance of loading effect is very less. All the sensors are be operated by a +9V D.C supply. The LCD is connected to the controller via usual connections with 15th and 16th pins are given +9V and ground connection for backlighting which is useful for viewing in low light. The display shows moisture content is percentage as programmed. The code is written so that it can collect data from a certain server address and send data to it.

4. CONCLUSION:

In today's world, the accidents due to drunken drive and rash driving cause a great damage to the lives of common people. Even though, the government passes many bills and laws to minimise and control the accidents done under the influence of alcohol. But it is not effective. However, the proposed system could minimise and control the accidents made due to drunken and drive. This system continuously monitors the alcohol level consumed by the driver and when, it attains the maximum threshold value then the system stops the ignition system of the vehicle preventing the accidents. Moreover, it also monitors the heart beat rate of the driver frequently. The sensor readings are updated in the cloud from time to time through IoT. Even if the driver tries to escape after commiting the

accident, the readings in the cloud will act as a major evidence for the police to punish the culprit.

REFERENCES:

1. R.Suresh, S.Gopinath, K.Govindaraju, T.Devika, N.SuthanthiraVanitha, "GSM based Automated Irrigation Control using Raingun Irrigation System", International Journal of Advanced Research in Computer and Communication Engineering Vol. 3, Issue 2, February 2014.

2. Pavithra D.S, M. S .Srinath, "GSM based Automatic Irrigation Control System for Efficient Use of Resources and Crop Planning by Using an Android Mobile", IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) Vol 11, Issue I, Jul-Aug 2014, pp 49-55.

3. LaxmiShabadi, NandiniPatil, Nikita. M, Shruti. J, Smitha. P&Swati. C, "Irrigation Control System Using Android and GSM for Efficient Use of Water and Power",International Journal of Advanced Research in Computer Science and Software Engineering, Volume 4, Issue 7, July 2014.

4. Shiraz Pasha B.R., Dr. B Yogesha, "Microcontroller Based Automated Irrigation System", The International Journal Of Engineering And Science (IJES), Volume3, Issue 7, pp 06-09, June 2014.

5. S. R. Kumbhar, Arjun P. Ghatule, "Microcontroller based Controlled Irrigation System for Plantation", Proceedings of the International MultiConference of Engineers and Computer Scientists 2013Volume II, March 2013.

6. Yunseop (James) Kim, Member, IEEE, Robert G. Evans, and William M. Iversen, "Remote Sensing and Control of an Irrigation System Using a Distributed Wireless Sensor Network", IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, Volume 57, Number 7, JULY 2008.

7. Venkata Naga RohitGunturi, "Micro Controller Based Automatic Plant Irrigation System", International Journal of Advancements in Research & Technology, Volume 2, Issue4, April-2013.

8. MahirDursun and SemihOzden, "A wireless application of drip irrigation automation supported by soil moisture sensors", Scientific Research and Essays, Volume 6(7), pp. 1573-1582, 4 April, 2011.

9. S. Harishankar, R. Sathish Kumar, Sudharsan K.P, U. Vignesh and T.Viveknath, "Solar Powered Smart Irrigation System", Advance in Electronic and Electric Engineering, Volume 4, Number 4 (2014), pp. 341-346.

10. AgriSETA, Sector Analysis agriculture, Department of Higher Education and Training, South Africa, 2010

11. Cousins, B., What is a smallholder? Class analytic perspectives on small-scale farming and agrarian reform in South Africa, http://www.plaas.org.za/pub2/downloads/wp16/

12. Milimo, J.T., Shilito, T., Brock, K., The poor of Zambia speaks, Zambia Social Investment Fund, http://www.worldbank.org/afr/wps/wp85.pdf, 2000

13. National Department of agriculture, http://www.nda.agric.za/docs/GenPub/DevStrat 2007.pdf, 2007

14. Rouhani, Q.A., Brits, P.J., Report WRC: TT235/04, Rhodes University, 2004 15. Siegel, P.B., Poverty reducing potential of small-holder agriculture in Zambia: dualism and dualism within dualism, PVA Consultation workshop, Lusaka, 2005.

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GSM BASED SMART HOME AND DIGITAL NOTICE BOARD

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ABSTRACT:

The project presents a digital notice board and a home automation system using a GSM SIM900 module. The idea behind this project is to provide its users with a simple, fast and reliable way to put up important notices in an LCD where the user can send a message to be displayed in the LCD. The message can be sent through an android application designed in this project, to the GSM SIM900 module which has a SIM card inside it. Similarly, a home automation system has been developed where home appliances like light, fan etc. can be switched on or off using the same android application designed in this project. So, using the android application, the home appliances can be controlled and notices can be put up in an LCD display from any location in the world. It uses a microcontroller for system control, GSM technology for communication and sends SMS containing the message through the android application. The project consists of a 32-bit CONTROLLER based microcontroller ARDUINO UNO, GSM SIM900 module, an LCD, a motor and an android application for user interface with the hardware. The device can be used anywhere irrespective of the place of deployment provided mobile network connectivity is available.

Keywords: Temperature sensor, GPS, GSM.

1. INTRODUCTION:

In this project, a hardware capable of controlling electronic appliances and displaying notices electronically using an android application has been built. So, the hardware can perform broadly two functions. For controlling home appliances, the system can be used in much different kind of situations where as user can switch on/off any home appliance connected to it from anywhere using an android application installed in a smart phone. In order to display notices, a user can use the same application to type a notice and click on the send button to get it displayed. Both the functionality can be used only if sufficient balance amount is left in the user's SIM card since each access transacts a fixed amount for SMS. The motivation behind such a project is mainly to reduce physical effort for operating appliances especially for aged people. Also, it might help a person to save energy by switching off appliances on being out of home or to switch on appliances to get services like washing clothes, cooling room, heating water done by the time he reaches home. Another reason for this project is over usage of paper in educational institutions for printing notices. Due to mushrooming paper usage day by day, lot of trees is being cut which is harmful for the environment. So, if notices are displayed everywhere electronically, it would reduce paper usage and make communication easier and faster.

2. RELATED STUDY:

The hardware capable of controlling home appliances and displaying notices electronically using an android application has been built. So, the hardware can perform broadly two functions. For controlling home appliances, the system can be used in many different kind of situations where a user can switch on/off any home appliance connected to it from

anywhere using an android application installed in a smartphone. In order to display notices, a user can use the same application to type a notice and click on the send button to get it displayed. Both the functionality can be used only if sufficient balance amount is left in the user's SIM card since each access transacts a fixed amount for SMS. The hardware consists of an ARM based microcontroller ARDUINO UNO that communicates to the application through a GSM mobile communication network module which uses a SIM card to receive messages. ARDUINO UNO itself retrieves message and sends signal to switch on/off a device or display a notice. The motivation behind such a project is mainly to reduce physical effort for operating appliances especially for aged people. Also, it might help a person to save energy by switching off appliances on being out of home or to switch on appliances to get services like washing clothes, cooling room, heating water done by the time he reaches home. Another reason for this project is over usage of paper in educational institutions for printing notices. Due to mushrooming paper usage day by day, lot of trees are being cut which is harmful for the environment. So, if notices are displayed everywhere electronically, it would reduce paper usage and make communication easier and faster. A GSM based system is flexible, durable without any risk of getting hacked. Such a system has a low cost of installation and maintenance. The other sections of the paper are organized as follows: Section-II is a discussion about earlier works in this field, Section-III briefs the devices of the system, Section-IV gives the outline of the system operation and Section- V explains the application.

3. PROPOSED SYSTEM:

GSM Based Wireless Electronic Board helps in passing messages almost immediately by sending SMS which is better and more reliable than the old traditional way of pasting messages on notice board. It is used in enhancing the security system and also to make awareness of the emergency situations and avoid many dangers in industries. The main aim of this paper is to design SMS driven automatic display board which can replace the currently used conventional wooden notice boards in most universities. The notice board displays messages sent from the user's mobile. When a user sends a message from his mobile phone, it is received by a SIM loaded GSM modem at the receiver unit. The GSM modem is interfaced to the control unit to receive messages from the user. The message received is sent to the microcontroller that further displays it on electronic notice board which is equipped with a display unit interfaced to a microcontroller. This paper is within the scope of wireless communication (GSM wireless communication). Global System for Mobile communication (GSM) is a digital mobile telephony system which is widely used in many parts of the world. GSM uses a variation of Time Division Multiple Access (TDMA) which is the most widely used of the three digital wireless telephony technologies (TDMA, GSM and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1800 MHz frequency band.

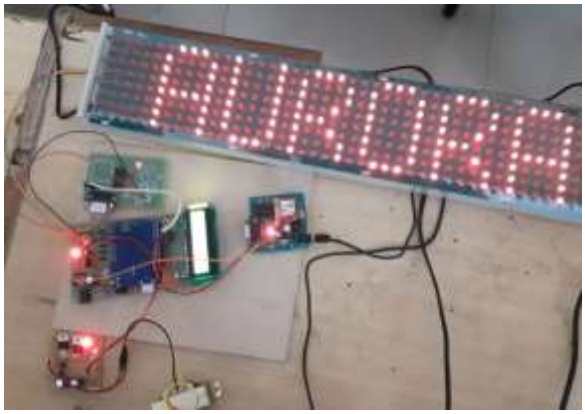

Fig.3.1. Hardware kit image.

4. RESULTS EXPLANATION:

This section describes the overall process of the implemented system. Several testing were performed to ensure proper execution and assembly of the intended result. The diagrams below show the various outputs of the designed system. When the notice board is plugged to a power outlet, the display comes on and begins to display the last message that is received. When a new message is sent, it automatically overrides the last message on the display and begins to display the new message..

Fig.4.1. LED display DATA.

After clicking, while the phone delivers the message, at that time, the message, ”Wait request in progress” gets displayed in the lower part of screen as shown in figure.

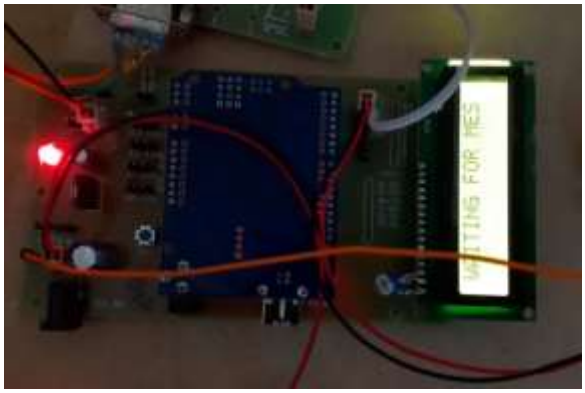

Fig.4.2. Waiting for message.

As soon as the message gets delivered, ”Notice sent” message pops up as shown in figure 9. Thus, the notices can be delivered this way through the application to get them displayed.

5. CONCLUSION:

The project established a digital notice board and home automation using 32-bit microcontroller and GSM successfully. It is cheap, quick, reliable and secured for any organization that requires to circulate notices regularly and reduces physical effort as well as

ensures energy consumption management for any user. Although only fan has been driven through the system, in future, other devices like microwave, washing machine can also be operated while the user is aged or not at home.

REFERENCES:

1. "Bluetooth based attendance management system", Vishal Bhalla Department of Computer Science And Engineering ,Dronacharya College of Engineering & Vijay Gupta Department of Computer Science And Engineering Dronacharya College of Engineering, International Journal of Innovations in Engineering and Technology (IJIET), Vol. 3 Issue 1 October 2013

3. "A remote lock system using bluetooth communication", Hae-Duck J. Jeong, Jiyoung Lim and WooSeok Hyun Department of Computer Software Korean Bible University, 2014 Eighth International Conference on Innovative Mobile and Internet Services in Ubiquitous Computing

4. "Design and implementation of a smart fire alarm system using gsm technologies via short messages service", Liu L., Sun R., Sun Y. and AlSarawi S., Int. J. Computer Aided Engineering and Technology, Vol. 2, No. 2/3, P.: 218–233, (IEEE 2010)

5. "Gsm based automatic railway gate control system with real time monitoring", R. JAGADEESH CHANDRA PRASAD1, Assistant professor, ECE Department1 P. ANJI REDDY2, B.Tech Student, ECE Department, International Journal of Science, Engineering and Technology Research (IJSETR), Volume 5, Issue 3, March 2016

6. "E-mail interactive home automation system",SirisillaManoharMtech (Embedded Systems) ,D. Mahesh Kumar Assoc.Prof , International Journal of Computer Science and Mobile Computing Vol. 4, Issue. 7, July 2015

7. "Development of a gsm based control system for electrical appliances", Oke A. O., Emuoyibofarhe J. O., Adetunji A. B. Department of Computer Science and Engineering LadokeAkintola University of Technology, International Journal of Engineering and Technology Volume 3 No. 4, April, 2013

8. "Gsm based smart street light monitoring and control system", Ajith Kumar M, Dr.ChandrakantNaikodi, Dr. L. Suresh MTech(CNE)-4th Sem, Professor, Department of Computer Science and Engineering, Principal, International Journal of Engineering Research 20 may 2016

9. "Water level indicator using smart bluetooth", OmkarNatu Department of Computer Science, PVPIT, International Journal on Computer Science and Engineering (IJCSE), Vol. 5 No. 03 Mar 2013

10. "Gsm based automatic irrigation control system for efficient use of resources and crop planning by using an android mobile", Pavithra D. S , M. S .Srinath PG Student, Department of ME, MCE, Volume 11, Issue 4 Ver. I (Jul- Aug. 2014)

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IOT BASED ANTIHUNT ALARM SYSTEM FOR TREES IN FOREST

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ABSTRACT:

Nowadays their area unit numerous occurrences regarding the pirating of trees like sandal, Sag wan and then forth. These trees area unit high-ticket and pitiful. They're utilized within the medicinal sciences, beautifying agents. To limit their sneaking and to spare woodlands around the world some preventive estimates ought to be sent. The wave got designed up a framework that may be utilized to limit sneaking. The structure framework utilizes 3 sensors tilt sensor to acknowledge the tendency of the tree once it's being cut, temperature sensor to determine timberland fires, a sound sensor for the successful discovery of unlawful work for instance so, even the sounds created whereas chopping out the tree area unit in addition detected. Information created from these sensors is consistently observed with the page. As for the sensors, their yield gadgets area unit initiated through a hand-off switch. For a tilt sensor and sound sensor, a ringer is enacted and for the temperature sensor, the water siphon is actuated. Created data is placed away within the cloud Server over the Wi-Fi module. Woods authorities square measure suggested once an occasion happens therefore correct move is created.

Keywords: WIFI module, Temperature sensor, switch module.

1. INTRODUCTION:

Hunt is not identified with India simply, China, Australia, and the African nation's area unit in addition to battling with the same issue. Indian sandalwood prices 12000 to 13000 government agency for each kilogram through in worldwide market red sanders wood prices government agency ten centres for every ton. The Indian true sandalwood has turned out to be uncommon as recently,

attempting to control its conceivable misfortune, the Indian government is attempting to restrict the exportation of wood. For a private, the most extreme admissible buy limit is not to surpass three.8kg consistent with Govt. On the off probability that the tree is as of currently government-controlled, at that time, its evacuation is denied whether or not on personal or sanctuary grounds till the tree is thirty years ancient. sneaking of sandalwood has created money and peace problems in territories circumscribing in the Republic of India. The basic goal of this undertaking is to make up a framework that can be utilized to confine the sneaking of sandalwood trees. Today internet application development demand is very high. So IOT is a major technology by which we can produce various useful internet applications. Nowadays there are many internets about smuggling of trees like Sandal, Sagwan etc. These trees are very costly and meagre. They are used in the medical sciences, cosmetics. To restrict their smuggling and to save forests around the globe some preventive measures need to be deployed. We have developed a system which can be used to restrict smuggling. The design system uses three sensors tilt sensor, temperature sensor and sound sensor. For tilt sensor and sound sensor buzzer is activated and for temperature sensor water pump is activated. The implementation of a real time, wireless sensor network and data logging system which will be a sophisticated and a cheap modern technology to make monitoring more robust, effective and feasible. WSN is a most emerging technology, widely used in many industrial applications such as monitoring, maintenance, security and control application, specific in remote monitoring applications etc. In forest areas, WSN are widely used for fire detection in forest, to detect poaching of trees, for environmental monitoring, etc.

2. RELATED STUDY:

Most fierce blazes in timberlands and forests today are brought about by individuals because of abuse of flame for change of woodlands to agrarian terrains. The goal of the task is to keep the sneaking, illicit logging and other anthropogenic exercises in the timberland. Such sort of framework can be utilized in any zone of backwoods which is exceptionally influenced by pirating and illicit cutting. There is no requirement for the

watchman to travel entire woods. We can see the visuals of the considerable number of happenings in the backwoods at the base station. Accurate area of tree cutting can be found effectively as well. The microcontroller frames the core of the framework and all the sensor hubs are associated with the controller unit. The sensor information is prepared in the microcontroller and is transmitted to the collector unit. The recipient unit chooses whether the ecological conditions prompts woods fire or not and is likewise cautioned about the unlawful exercises assuming any.

At the point when little DC current moves through the loop of the transfer, curl empowers. Hence, the armature is pulled in towards the NO (Normally Open) stick. At the point when the present move through the curl stops, armature returns to the ordinary position, implies COM stick is associated with NC (Normally Connected) stick. Transfer activity is same for all fundamental transfers. A hand-off is an electro mechanical switch, it comprises of a loop. At the point when little flow moves through the curl, attractive field is prompted that makes the switch move, to close or open the electrical association. Ordinarily a Relay is utilized to control High voltage (AC or DC) circuit utilizing little DC voltage circuit with no direct electrical association between them. High voltage circuit and low DC voltage circuit are attractively connected yet electrically isolated.

3. PROPOSED SYSTEM:

The main idea is to design a portable wireless sensor node which will be a part of a Wireless Sensor Network. This system will consist of two modules one involving sensors and controller module which will be at tree spot another one is android phone. This is an IOT based project, in case of tilt sensor and the buzzer turns on when tree bends and for temperature sensor water pump is turned on in case of forest fire through relay switch.

WORKING METHODOLOGY:

Module 1- Arduino UNO The Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion boards and other circuits. Module 2- Tilt

Sensor Tilt sensors are used to measure angle within a limited range of motion tilt sensors are called as inclinometers because the Sensors just produce a signal but inclinometers produce both readout and a signal. These devices produce an electrical signal that varies with an angular movement. Module 3- Temperature Sensor It is a device which is designed specifically to measure the hotness or coldness of an object or in an environment. We have used LM35 Temperature Sensor. It can measure temperature more correctly compare with thermistor. The operating temperature range is from 40°C. The LM35 has an output voltage that is proportional to the Celsius temperature. Module 4- Sound Sensor The Sound sensor is a board that combines a microphone and some processing circuit. This module is used to detect the intensity of sound. When the sensor detects a sound, it processes an output voltage signal voltage is sent to a microcontroller then performs necessary processing. Module 5- Relay Switch High voltage electronic devices can be controlled using relays. A Relay is a switch which is electrically operated by an electromagnet. The electromagnet gets activated with a low voltage, for example 5 volts from a microcontroller and it pulls a contact to make or break a high voltage circuit. One of the most advantage is you can do with an Arduino is controlling higher voltage (120-241V) devices like fans, light, heaters, and other household appliances. Module 6- Android Application.

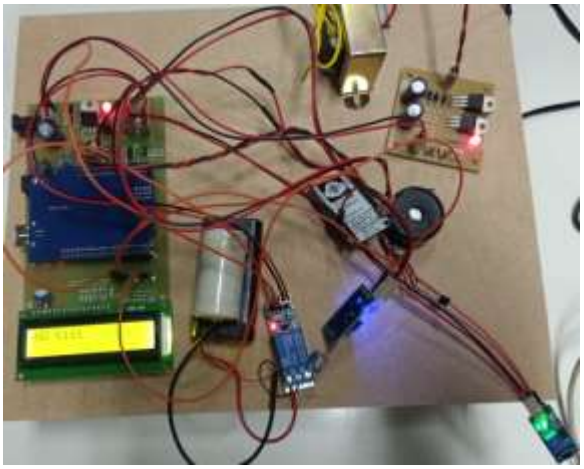

Fig.4.1 Hardware kit image.

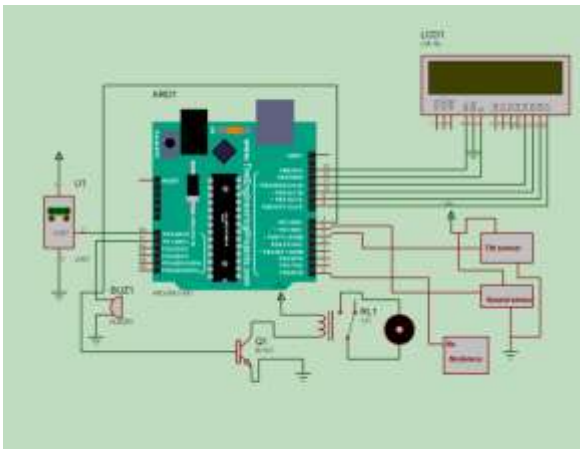

Fig.4.2. Schematic diagram.

5. CONCLUSION:

The system monitors when the tree logging occurs, the sound generated due to axing the tree is sensed by the sound sensor. Also if the tree bends, the buzzer is activated. And if in case forest fires, when the temperature of the surroundings increases its sensed by the temperature of the surroundings increases its sensed by the temperature sensor, through the relay switch the water pump is turned on. Then this generated data is send to the forest officer if any event occurs so that appropriate action can be taken.

REFERENCES:

[1] G Kavianand ; K Gowri Ganesh ; P Karthikeyan, Smart child rescue system from borewell (SCRS), Published in: Emerging Trends in Engineering, Technology and Science (ICETETS), International Conference on , 24-26 Feb. 2016,IEEE Xplore: 24 October 2016

[2] B. Bharathi, B. Suchitha Samuel, "Design and Construction of Rescue Robot and Pipeline Inspection Using Zigbee", International Journal Of Scientific Engineering and Research (IJSER), vol. 1, no. 1, September 2013K. Elissa, "Title of paper if known," unpublished.

[3] Palwinder kaur, Ravinder kaur, Gurpreet singh, "Pipeline Inspection And Bore well Rescue Robot", International Journal of Research in Engineering and Technology(IJRET), vol. 03, no. 04, April 2014.

[4] Raj Manish, P. Chakraborty, G.C. Nandi, "Rescue robotics in bore well Environment", Cornell university library [v1] Mon, Jun 2014.

[5] John Jose pottery, "robot for bore well rescue", amal jothi college of engineering, vol. 10, Jun 2009.

[6] S. Gopinath, T. Devika, L. Manivannan, N. Suthanthira Vanitha, "Rescue Child from Bore well using Embedded System", 2015.

[7] V. Venmathi, E. Poorniya, S. Sumathi, "Borewell Rescue Robot", International Journal of Computer Applications, vol. 113, no. 14, 2015.

[8] C.N. Sakhale, 2D.M. Mate, 3Subhasis Saha, Tomar Dharmpal, Pranjit Kar, Arindam Sarkar, Rupam Choudhury, Shahil Kumar, "An Approach to Design of Child Saver Machine for Child Trapped in Borehole", International Journal of Research in Mechanical Engineering, pp. 26-38, October-December 2013.

[9] G. Nithin, G. Gowtham, G. Venkatachalam, S. Narayanan, "School of Mechanical Building Sciences" in Design and Simulation of Bore well rescue robot- Advanced ARPN Journal of Engineering and Applied Sciences, India:VIT University, MAY 2014.

[10] Sridhar Palaniswamy, "Life Saving Machine", first International Conference on Interdisciplinary Research and Development, 31 May-1 June 2011.

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DESIGN AND DEVELOPMENT OF PRECISION AGRICULTURE SYSTEM USING WIRELESS SENSOR NETWORK

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ABSTRACT:

Software quality estimation is an activity needed at various stages of software development. It may be used for planning the project's quality assurance practices and for benchmarking. In earlier previous studies, two methods (Multiple Criteria Linear Programming and Multiple Criteria Quadratic Programming) for estimating the quality of software had been used Also, C5.0, SVM and Neutral network were experimented with for quality estimation. These studies have relatively low accuracies. In this study, we aimed to improve estimation accuracy by using relevant features of a large dataset. We used a feature selection method and correlation matrix for reaching higher accuracies. In addition, we have experimented with recent methods shown to be successful for other prediction tasks. Machine learning algorithms such as Xgboost, Random Forest and Decision Tree are applied to the data to predict the software quality and reveal the relation between the quality and development attributes. The experimental results show that the quality level of software can be well estimated by machine learning algorithms.

Keywords: SVM, ML, AI, software quality, multiple criteria.

1. INTRODUCTION:

Software applications may contain defects, originating from requirements analysis, specification and other activities conducted in the software development. Therefore, software quality estimation is an activity needed at various stages

STAGES:

[1]. It may be used for planning the project based quality assurance practices and for benchmarking. In addition, the number of defects per unit is considered one of the most important factors that indicate the quality of the software.

[2].There is two directly comparable studies on software quality prediction using defect quantities in ISBGS dataset. In the first study, the two methods (MCLP and MCQP) were experimented with the dataset and the results were compared

[3]. The quality level was classified according to: number of minor defect + 2*number of major defect + 4*number of extreme defect.

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The quality of level was to be either high or low. They used k-fold cross-validation technique to measure MCLP and MCQP's performance on the ISBSG database. Release 10 Dataset (released in January 2007) which contained 4,017 records and 106 attributes was used. After preprocessing, 374 records and 11 attributes remained in the dataset. In another study, the same data set was used again.

[4]. The software belonged to high quality class if it fulfills the following requirements: the extreme defects exist or the number of major defects is more than 1 or the number of minor defects is more than 10. The rest are assumed to belong to low quality class. After preprocessing, 746 projects and 53 attributes remained in the dataset. They used C5.0, SVM and Neutral network for classification. As an example to a more application oriented study Rashid et al.

[5] Used case based reasoning (CBR) for software quality estimation. CBR is a machine learning model which performs the learning process using the results of the previous experiments. Line of code, number of function, difficulty level, and development type and programmers experience are entered and these attributes are used for estimation. The deviation is calculated by using Euclidian distance (ED) or The Manhattan distance (MD). If the error in estimation is less than 10% then the record is saved to the database. Number of inputs that can be obtained from the user is limited. Also, it is necessary to have close values in the database in order to estimating precise values.

2. LITERATURE SURVEY

Software quality metrics in quality assurance to study the impact of external factors related to time:

Software quality assurance is a formal process for evaluating and documenting the quality of the work products during each stage of the software development lifecycle. The practice of applying software metrics to operational factors and to maintain factors is a complex task. Successful software quality assurance is highly dependent on software metrics. It needs linkage the software quality model and software metrics through quality factors in order to offer measure method for software quality assurance. The contributions of this paper build an appropriate method of Software quality metrics application in quality life cycle with software quality assurance. Design: The purpose approach defines some software metrics in the factors and discussed several software quality assurance model and some quality factors measure method. Methodology: This paper solves customer value evaluation problem are: Build a framework of combination of software quality criteria. Describes software metrics. Build Software quality metrics application in quality life cycle with software quality assurance. Results: From the appropriate method of Software quality metrics application in quality life cycle with software quality assurance, each activity in the software life cycle, there is one or more QA quality measure metrics focus on ensuring the quality of the process and the resulting product. Future research is need to extend and improve the methodology to extend metrics that have been validated on one project, using our criteria, valid measures of quality on future software project.

Software defect prediction: do different classifiers find the same defects:

During the last 10 years, hundreds of different defect prediction models have been published. The performance of the classifiers used in these models is reported to be similar with

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models rarely performing above the predictive performance ceiling of about 80% recall. We investigate the individual defects that four classifiers predict and analyse the level of prediction uncertainty produced by these classifiers. We perform a sensitivity analysis to compare the performance of Random Forest, Naïve Bayes, RPart and SVM classifiers when predicting defects in NASA, open source and commercial datasets. The defect predictions that each classifier makes is captured in a confusion matrix and the prediction uncertainty of each classifier is compared. Despite similar predictive performance values for these four classifiers, each detects different sets of defects. Some classifiers are more consistent in predicting defects than others. Our results confirm that a unique subset of defects can be detected by specific classifiers. However, while some classifiers are consistent in the predictions they make, other classifiers vary in their predictions. Given our results, we conclude that classifier ensembles with decision-making strategies not based on majority voting are likely to perform best in defect prediction.

A Knowledge Discovery Case Study of Software Quality Prediction:

Software becomes more and more important in modern society. However, the quality of software is influenced by many un-trustworthy factors. This paper applies MCLP model on ISBSG database to predict the quality of software and reveal the relation between the quality and development attributes. The experimental result shows that the quality level of software can be well predicted by MCLP Model. Besides, several useful conclusions have been drawn from the experimental result.

Evidence-based software portfolio management:

In this paper we describe and evaluate a tool for Evidence-Based Software Portfolio Management (EBSPM) that we developed over time in close cooperation with software practitioners from The Netherlands and Belgium. Objectives: The goal of the EBSPM-tool is to measure, analyze, and benchmark the performance of interconnected sets of software projects in terms of size, cost, duration, and number of defects, in order to support innovation of a company's software delivery capability. The tool supports building and maintaining a research repository of finalized software projects from different companies, business domains, and delivery approaches. Method: The tool consists of two parts. First, a *Research Repository*, at this moment holding data of for now 490 finalized software projects, from four different companies. Second, a *Performance Dashboard*, built from a so-called *Cost Duration Matrix*. Results: We evaluated the tool by describing its use in two practical applications in case studies in industry. Conclusions: We show that the EBSPM-tool can be used successfully in an industrial context, especially regarding its benchmarking and visualization purposes.

3. METHODOLOGY

Secondly, feature importance table reveal the relationship of the target class with other selected classes. Among the best of the factors selected to estimate the quality, it is revealed that the most influencing attribute of the dataset is the Number of Defects. We used Python scikit-learn library for implementing the models. Training and test data were separated by %33-%67 ratio. Multi-class

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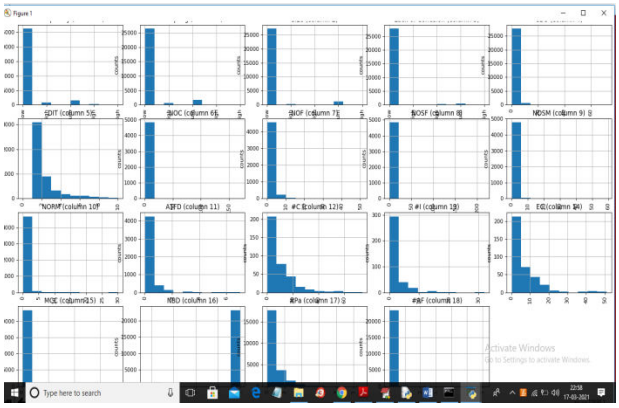
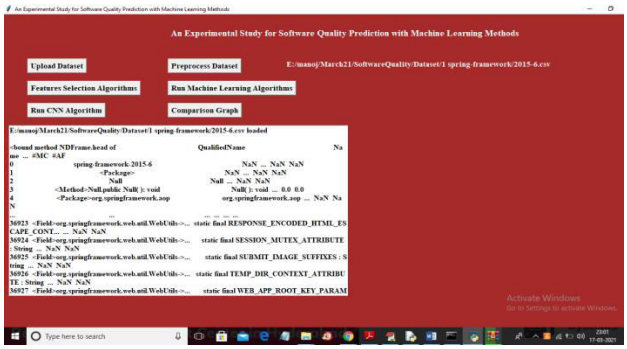
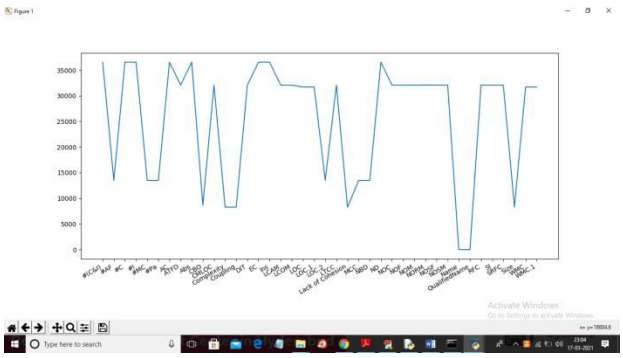
classification algorithms in the scikit-learn library was used for estimation.



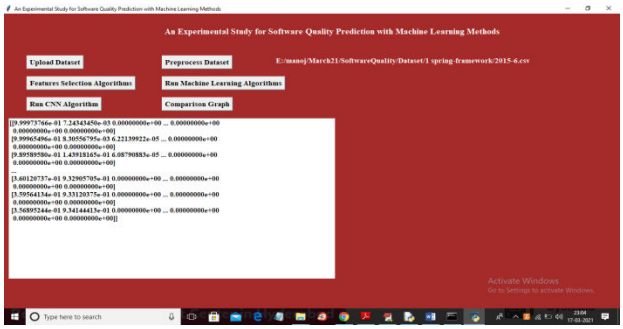
In above graph we can see each graph represents one column from dataset and from that columns its counting each distinct value from and plot in that graph for example in second graph NOC columns 3 different values and its plotting 3 different bars with count and no close above graph to get below screen



In above screen displaying values from dataset and we can see dataset contains NAN (missing values) and string non numeric values and we need to replace all missing and non-numeric values with their count so click on 'Preprocess Dataset' button



In above graph x-axis represents column names and y-axis represents total missing values counts in that column and now close above graph to get below screen



In above screen all missing an string values are replace with numeric values and now click on 'Features Selection Algorithms' button to select important features from dataset and then split dataset into train and test part

In above graph the box which contains value >0.5 will be consider as important attributes and now close above graph to get below screen

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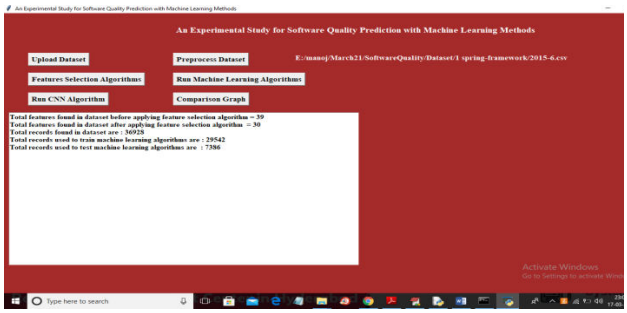
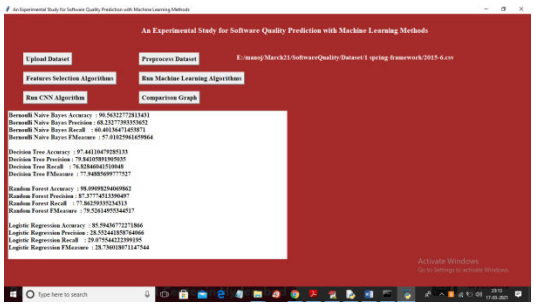
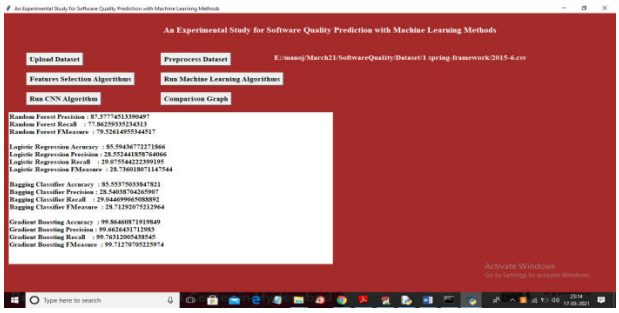


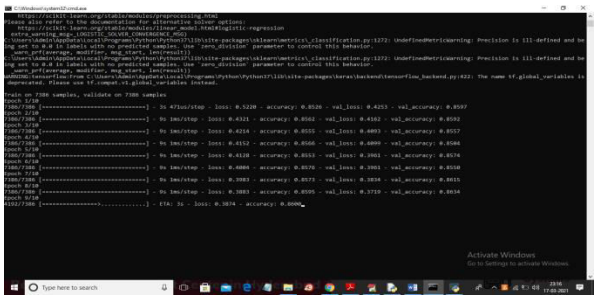
In above screen before applying feature selection algorithm dataset contains 39 features/columns and after applying PCA feature selection we got 30 important features and dataset contains 36928 records and application using 7386 records for testing and 29542 records for training and now both train and test dataset is ready and now click on 'Run Machine Learning Algorithms' button to run all machine learning algorithms



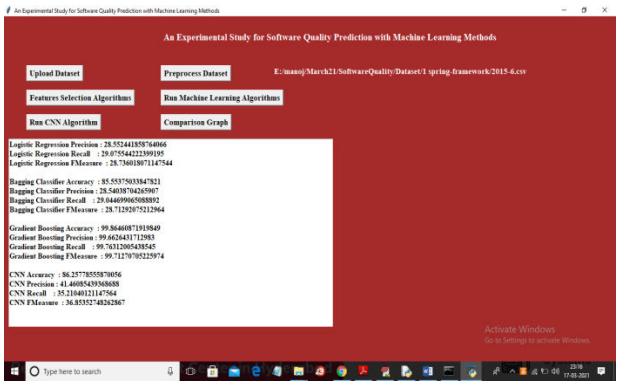
In above screen we can precision, recall, accuracy and fscore for all algorithms



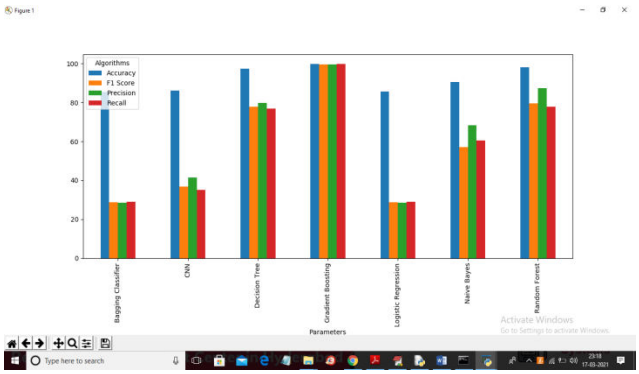
Now click on 'Run CNN Algorithm' button to run CNN algorithm and to get below screen



In above screen to train CNN we took 10 iterations or epoch and at each epoch accuracy get better and loss get reduce and after 10 iterations will get below screen



In above screen we got output values for CNN also and now click on 'Comparison Graph' button to get below screen



In above graph we are plotting accuracy, precision, recall and accuracy for each algorithm

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CONCLUSION

In this paper we have experimented classification algorithms using Scikit-learn library on two dataset. We have experimented with recent algorithms that support multi-class classification. The accuracies achieved by using these algorithms are 92.28% on EBSPM Dataset and 92.22% on ISBSG Dataset. In comparison to previous directly comparable studies, acceptable level multiclass quality prediction could be achieved.

REFERANCES

[1] Vijay, T. John, D. M. G. Chand, and D. H. Done. "Software quality metrics in quality assurance to study the impact of external factors related to time." International Journal of Advanced Research in Computer Science and Software Engineering, 2017.

[2] D. Bowes, T. Hall, and J. Petrić, "Software defect prediction: do different classifiers find the same defects?." Software Quality Journal, 26(2), 2018, pp. 525-552.

[3] X. Wang, Y. Zhang, L. Zhang and Y. Shi, "A Knowledge Discovery Case Study of Software Quality Prediction: ISBSG Database," 2010 IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology, Toronto, ON, 2010, pp. 219-222.

[4] X. Wang, Y. Zhang, L. Zhang and Y. Shi, "A Knowledge Discovery Case Study of Software Quality Prediction Based on Classification Models: ISBSG Database," The 11th International Symposium on Knowledge Systems Sciences (KSS 2010), 2010

[5] E. Rashid, S. Patnaik, and V. Bhattacherjee, "Software quality estimation using machine learning: Case-Based reasoning technique, " International Journal of Computer Applications, 2012

[6] www.isbsg.org

[7] https://goverdson.nl/

[8] H. Huijgens,"Evidence-based software portfolio management: a tool description and evaluation", 20th International Conference on Evaluation and Assessment in Software Engineering (EASE '16), 201

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Brief Performance Analysis of Routing Protocols

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[1]*Research Scholar,* [2]*Prof of Bharat CLG. of Tech, Singhania University Pacheri Beri, Rajasthan*

Abstract: ***Routing in Wireless Sensor Networks (WSNs) plays an important role in areas such as environment-oriented surveillance and traffic monitoring. Here we have explored the large contribution of routing to WSNs. This paper is primarily intended to categorize routing issues and investigate optimization issues related to routing. The following describes various features related to routing energy, security, speed, and reliability issues. The documentation is then analyzed for simulated environments and test configurations, knowledge of quality of service (QoS) and implementations in various applications..***
Keywords: Wireless Sensor Networks; reliability, energy-efficient data communication; energy management; energy enviorment

I. INTRODUCTION

In WSN, routing is a very important task that is to be handled carefully. Routing technique is needed for sending the data between the sensor nodes and the base stations, so as to establish communication. The main criterion, which is focused in this paper, is about the routing protocol that varies based on the application. The routing problem leads to decreased network lifetime with increased energy consumption. So, various routing protocols have been developed to minimize the energy consumption and to maximize the network lifetime. The routing protocols can be categorized based on the nodes' participation, clustering protocols, mode of functioning and network structure. The various challenges in routing include energy consumption, node deployment, scalability, connectivity, coverage, security. Fig. 1 explains the routing protocol of the wireless sensor networks.

II. LITERATURE REVIEW

In 2015, 2% of works are done in the field of routing, which is comparatively % higher than the works that are done in the consecutive years 2008, 2009, 2011 and 2012. About 8% works are done in 201 and 2016. The predicted data represent the recent research and developments in the field of routing in wireless sensor networks. The routing protocols have been developed to face the challenges, which are caused due to the features such as energy, security, delay and error. The protocol that imparts energy efficiency has been developed more in number than the other featured protocols and it has peaked 38. 6% in 2015. The percentage of works that pertain to the development of security based routing protocols has been found to double every year, since 2013. Further, the number of delay less protocols that has been developed from 2011 onward is found to exhibit a constant percentage of 6.67%, except for the year 2015. The interest shown toward developing a reliable protocol has dropped in 2012. However, the demand for error free protocols has risen to about 50% in 2015. And till now routing protocol are the advanced topic of research.

III. ENERGY EFFICIENT ROUTING

In 2008, Wang et al. [1] have developed a multi layer routing scheme to optimize routing in Distributed Source coding (DSC). The network performance was enhanced by energy scheduling, which satisfies the end to end transmission rate. In addition, they have also proposed the energy usage scheduling concept for efficient energy optimization.
Phan et al. [2] have worked on the joint crosslayer optimization method for efficient routing and energy distribution to meet the QoS requirements. They have found that the optimization problem equals the twostep convex problem and the problem of increasing the network lifetime is quasiconvex. In 2007, Baek and Veciana [9] have focussed on the tradeoff optimization problem to achieve energy efficiency in ad hoc network systems. The tradeoff optimization is done between the improved spatial balance of energy burdens and the energy cost of spreading traffic. Further, multipath routing was found to minimize the probability of energy loss. Guha et al. [11] have examined poweraware routing schemes in wireless networks to propose a fair coalition routing algorithm.

IV. DELAYLESS PROTOCOLS

In 2011, Basan and Jaseemuddin [3] have considered both the operations of the underlying directional MAC protocols and the physical interference to develop a colour conflict graph abstraction. The developed model renders a framework to analyze the wireless link conflicts by evaluating the end to end delay transmission. In 2012, Dai et al. [2] have proposed a QoS routing algorithm to send the visual information with quality of service. A correlation aware inter node differential coding scheme was introduced to minimize the traffic hub and the average delay in different source coding is studied. In 2013, Chen and Shen [18] have worked on the routing schemes in delay tolerant networks and developed an inter landmark data routing algorithm, called

DTNFLOW. In 2011 , Cheng et al. [1] have developed an efficient QoS aware geographic opportunistic routing scheme for the wireless sensor networks. In terms of latency, the protocol has organized the prioritized sets. In 2015, Tang et al. [5] have studied the routing algorithm of network on chip and introduced a novel metric, known as routing pressure, for evaluating the performance of the routing method. The traditional methods use degree of adaptiveness as the metric measure, but it imparts very less performance. So, the new metric measure that has the capacity to predict congestion has been introduced. Jie et al. [15] have addressed the issue in the publishing or the subscriber system and proposed a novel algorithm, known as Hierarchy hybrid routing scheme. The proposed scheme was able to deliver the local publication to the core domain and solves the issue in remote publication routing into the edge domain, allowing the objects to be routed aptly to the subscribers. Zhang and Dong [19] have examined few issues in routing such as the delay in transmission and proposed a bypassing void routing protocol. The whole theory was dependent upon the virtual coordinates to prevent the void problem

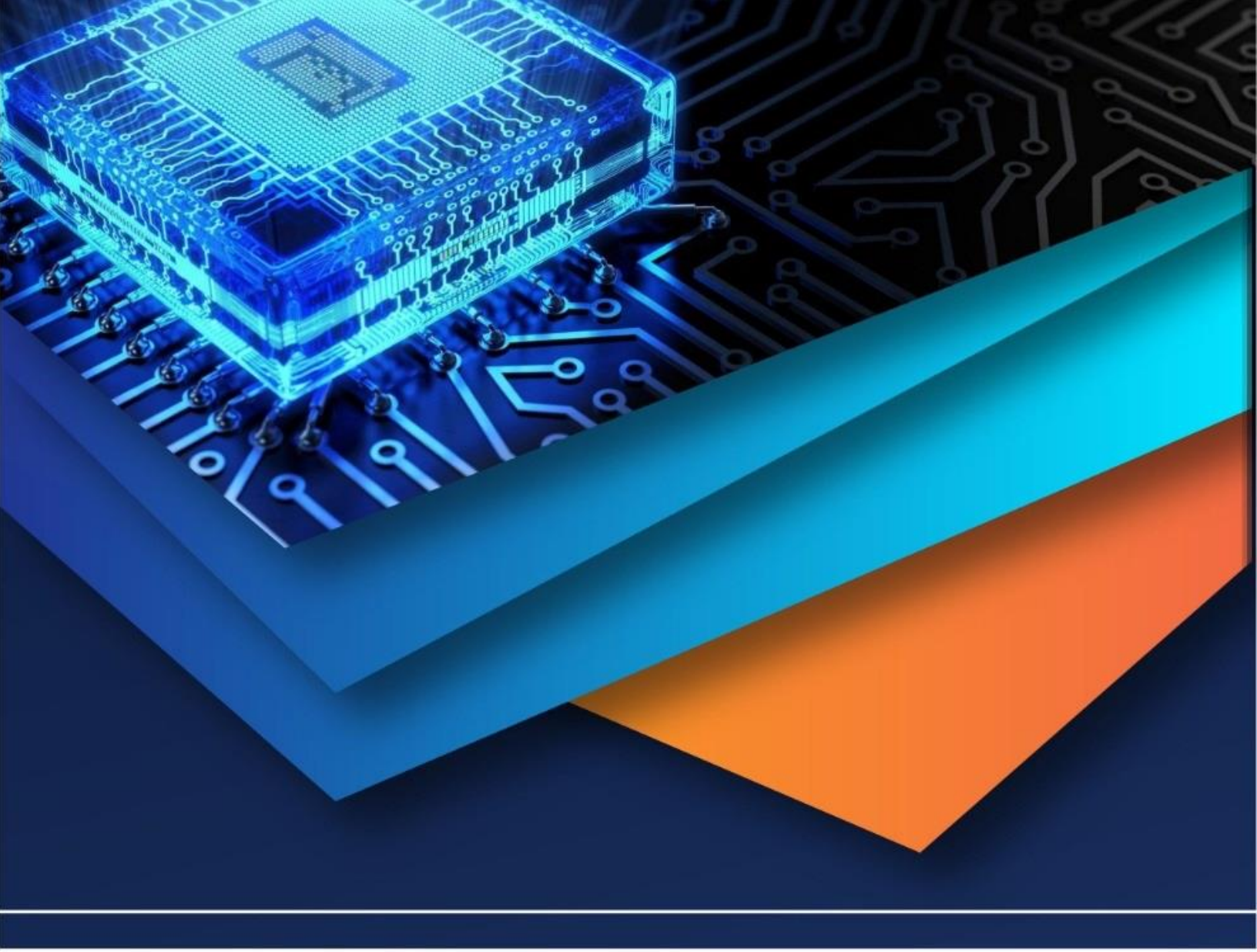
V. CONCLUSION

In this paper, we have discussed the overview on routing protocls (its ,features, advantages, disadvantages), Routing protocol, Wireless network and security with the concept of data transfer, in the paper, in which we get to know about what is different protocols its survey how important it is and how it has been used and the issues that should kept in mind for the betterment of a reliable and comfortable result. Too, considered security with their goals and attacks and From all we can conclude that routing is a swift developing and dynamic field with a vast scope of research work in this field.

REFERENCES

[1] Akyildiz, I.F.; Weilian, S.; Sankarasubramaniam, Y.; Cayirci, E. A survey on sensor networks. IEEE Commun. Mag. 2002, 40, 102–114. [CrossRef]
[2] Anastasi, G.; Conti, M.; Di Francesco, M.; Passarella, A. Energy conservation in wireless sensor networks: A survey. Ad Hoc Netw. 2009, 7, 537–568. [CrossRef]
[3] Raghunathan, V.; Schurgers, C.; Park, S.; Srivastava, M. Energy-aware wireless microsensor networks. IEEE Signal Process. Mag. 2002, 19, 40–50. [CrossRef]
[4] Chowdhury, S.; Hossain, A. Different Energy Saving Schemes in Wireless Sensor Networks: A Survey. Wirel. Pers. Commun. 2020, 114, 2043–2062. [CrossRef]
[5] Singh, J.; Kaur, R.; Singh, D. A survey and taxonomy on energy management schemes in wireless sensor networks. J. Syst. Archit. 2020, 111. [CrossRef]
[6] Singh, J.; Kaur, R.; Singh, D. Energy harvesting in wireless sensor networks: A taxonomic survey. Int. J. Energy Res. 2020. [CrossRef]
[7] Engmann, F.; Katsriku, F.A.; Abdulai, J.; Adu-Manu, K.S.; Banaseka, F.K. Prolonging the Lifetime of Wireless Sensor Networks: A Review of Current Techniques. Wirel. Commun. Mob. Comput. 2018, 2018. [CrossRef]
[8] Yetgin, H.; Cheung, K.; El-Hajjar, M.; Hanzo, L. A Survey of Network Lifetime Maximization Techniques in Wireless Sensor Networks. IEEE Commun. Surv. Tutor. 2017, 19, 828–854. [CrossRef]
[9] Yadav, S.; Yadav, R. A review on energy efficient protocols in wireless sensor networks. Wirel. Netw. 2016, 22, 335–350. [CrossRef]
[10] Rault, T.; Bouabdallah, A.; Challal, Y. Energy efficiency in wireless sensor networks: A top-down survey. Comput. Netw. 2014, 67, 104–122. [CrossRef]
[11] Cui, S.; Goldsmith, A.; Bahai, A. Energy-constrained modulation optimization. IEEE Trans. Wirel. Commun. 2005, 4, 2349–2360. [CrossRef]
[12] Rosas, F.; Oberli, C. Modulation and SNR optimization for achieving energy-efficient communications over short-range fading channels. IEEE Trans. Wirel. Commun. 2012, 11, 4286–4295. [CrossRef]
[13] Gumusalan, A.; Simon, R.; Aydin, H. Dynamic modulation scaling enabled multi-hop topology control for time critical wireless sensor networks. Wirel. Netw. 2020, 26, 1203–1226. [CrossRef]
[14] Nosratinia, A.; Hunter, T.E.; Hedayat, A. Cooperative communication in wireless networks. IEEE Commun. Mag. 2004, 42, 74–80. [CrossRef]
[15] Li, Q.; Hu, R.Q.; Qian, Y.; Wu, G. Cooperative communications for wireless networks: Techniques and applications in LTEadvanced systems. IEEE Wirel. Commun. 2012, 19, 22–29. [CrossRef]
[16] Shuguang, C.; Goldsmith, A.J.; Bahai, A. Energy-efficiency of MIMO and cooperative MIMO techniques in sensor networks. IEEE J. Sel. Areas Commun. 2004, 22, 1089–1098. [CrossRef]
[17] Soorki, M.; Manshaei, M.; Maham, B.; Saidi, H. On uplink virtual MIMO with device relaying cooperation enforcement in 5G networks. IEEE Trans. Mob. Comput. 2018, 17, 155–168. [CrossRef]
[18] Song, L.; Chai, K.; Chen, Y.; Loo, J.; Jimaa, S.; Iraqi, Y. Energy efficient cooperative coalition selection in cluster-based capillary networks for CMIMO IoT systems. Comput. Netw. 2019, 153, 92–102. [CrossRef]
[19] Singh, M.; Amin, S. Energy-efficient data transmission technique for wireless sensor networks based on DSC and virtual MIMO. ETRI J. 2020, 42, 341–350. [CrossRef]
[20] Peng, Y.; Al-Hazemi, F.; Kim, H.; Youn, C.H. Design and Optimization for Energy-Efficient Cooperative MIMO Transmission in Ad Hoc Networks. IEEE Trans. Veh. Technol. 2017, 66, 710–719. [CrossRef]
[21] Peng, Y.; Al-Hazemi, F.; Boutaba, R.; Tong, F.; Hwang, I.; Youn, C. Enhancing Energy Efficiency via Cooperative MIMO in Wireless Sensor Networks: State of the Art and Future Research Directions. IEEE Commun. Mag. 2017, 55, 47–53. [CrossRef]
[22] Peng, Y.; Li, J.; Park, S.; Zhu, K.; Hassan, M.; Alsanad, A. Energy-efficient cooperative transmission for intelligent transportation systems. Future Gener. Comput. Syst. 2019, 94, 634–640. [CrossRef]
[23] Correia, L.H.; Macedo, D.F.; dos Santos, A.L.; Loureiro, A.A.; Nogueira, J.M.S. Transmission power control techniques for wireless sensor networks. Comput. Netw. 2007, 51, 4765–4779. [CrossRef]

[24] Fernandes, D.; Ferreira, A.; Abrishambaf, R.; Mendes, J.; Cabral, J. Survey and taxonomy of transmissions power control mechanisms for wireless body area networks. IEEE Commun. Surv. Tutor. 2018, 20, 1292–1328. [CrossRef]
[25] Lee, W.; Kim, H.; Hong, M.; Kang, M.G.; Jeong, S.; Kim, N. A survey of the transmission-power-control schemes in wireless body-sensor networks. KSII Trans. Internet Inf. Syst. 2018, 12, 1854–1868. [CrossRef]
[26] Sodhro, A.; Chen, L.; Sekhari, A.; Ouzrout, Y.; Wu, W. Energy efficiency comparison between data rate control and transmission power control algorithms for wireless body sensor networks. Int. J. Distrib. Sens. Netw. 2018, 14. [CrossRef]
[27] Sodhro, A.; Sangaiah, A.; Sodhro, G.; Lohano, S.; Pirbhulal, S. An energy-efficient algorithm for wearable electrocardiogram signal processing in ubiquitous healthcare applications. Sensors 2018, 18, 923. [CrossRef]
[28] Sodhro, A.; Pirbhulal, S.; Qaraqe, M.; Lohano, S.; Sodhro, G.; Junejo, N.; Luo, Z. Power Control Algorithms for Media Transmission in Remote Healthcare Systems. IEEE Access 2018, 6, 42384–42393. [CrossRef]



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Types Routing Protocols based one Energy Efficiency

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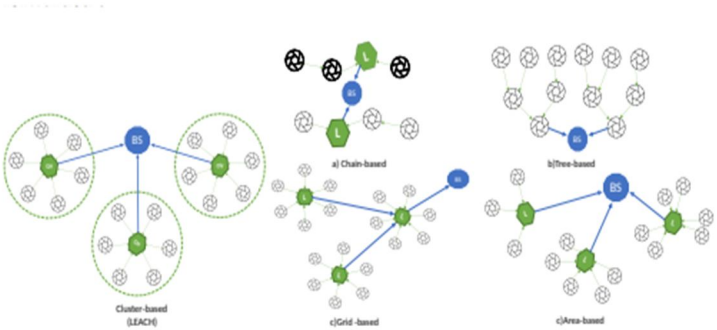
Abstract: ***Wireless sensor networks (WSNs) consist of autonomous sensors distributed in space to monitor physical or environmental conditions such as temperature, sound, and pressure, and to coordinate communications. The information collected reaches its destination through the network infrastructure. Energy-efficient routing protocols are becoming more important because sensor nodes are power-limited devices. Several tiered routing protocols have recently been proposed to minimize power consumption. For example, LEACH is a basic hierarchical routing protocol that uses clustering to achieve energy efficiency. Much research has been done to eliminate the shortcomings and improve the performance of hierarchical routing protocols. WSN hierarchical routing protocols and analyzes the capabilities and performance of existing hierarchical routing protocols. It also compares existing routing protocols, highlights key technical differences, and provides a performance comparison of some LEACH-based routing protocols. Finally, this article highlights the issues and challenges of existing WSN routing protocols. It supports future research on the selection of appropriate research areas and provides guidance on the selection of energy saving methods in the energy efficient design of WSN routing protocols.***
Keywords: wireless sensor network, routing protocols, CSMA, CH, TDMA

I. INTRODUCTION &DISCUSSION

Hierarchical Routing Protocols Heinzelman et al. [56] proposed the first hierarchical routing protocol referred to as LEACH (Low Energy Adaptive Clustering Hierarchy). LEACH proposes a random rotation method to select the node with maximum energy level as the CH, and so uniformly distribute the energy load among the sensors in the network. CHs send advertisement messages to the whole WSN using CSMA. Each sensor node joins the cluster from which it receives the strongest signal. Next, CH schedules TDMA slots for each member in the cluster to send data to it. CH uses aggregation techniques to combine the data received from sensor nodes to save energy and bandwidth, and then this aggregated information is forwarded directly to the BS, i.e., using only one hop, The single hop transmission is the simplest method, but usually it is not suitable for large networks, where multiple hop transmission should be employed. In this case, data follows a multiple hop route across several CHs towards the BS, and so it is essential to use an energy aware routing protocol that avoids unnecessary transmissions and the overload in the nodes close to the BS. techniques can be performed by the CH, (iii) energy intensive operations such as coordination or data reduction are only carried out by the CH, (iv) it enables the powering off of some nodes, typically after sending data to the CH. On the other hand, hierarchical routing also improves network scalability by maintaining a hierarchical topology in the network. as shown in fig.



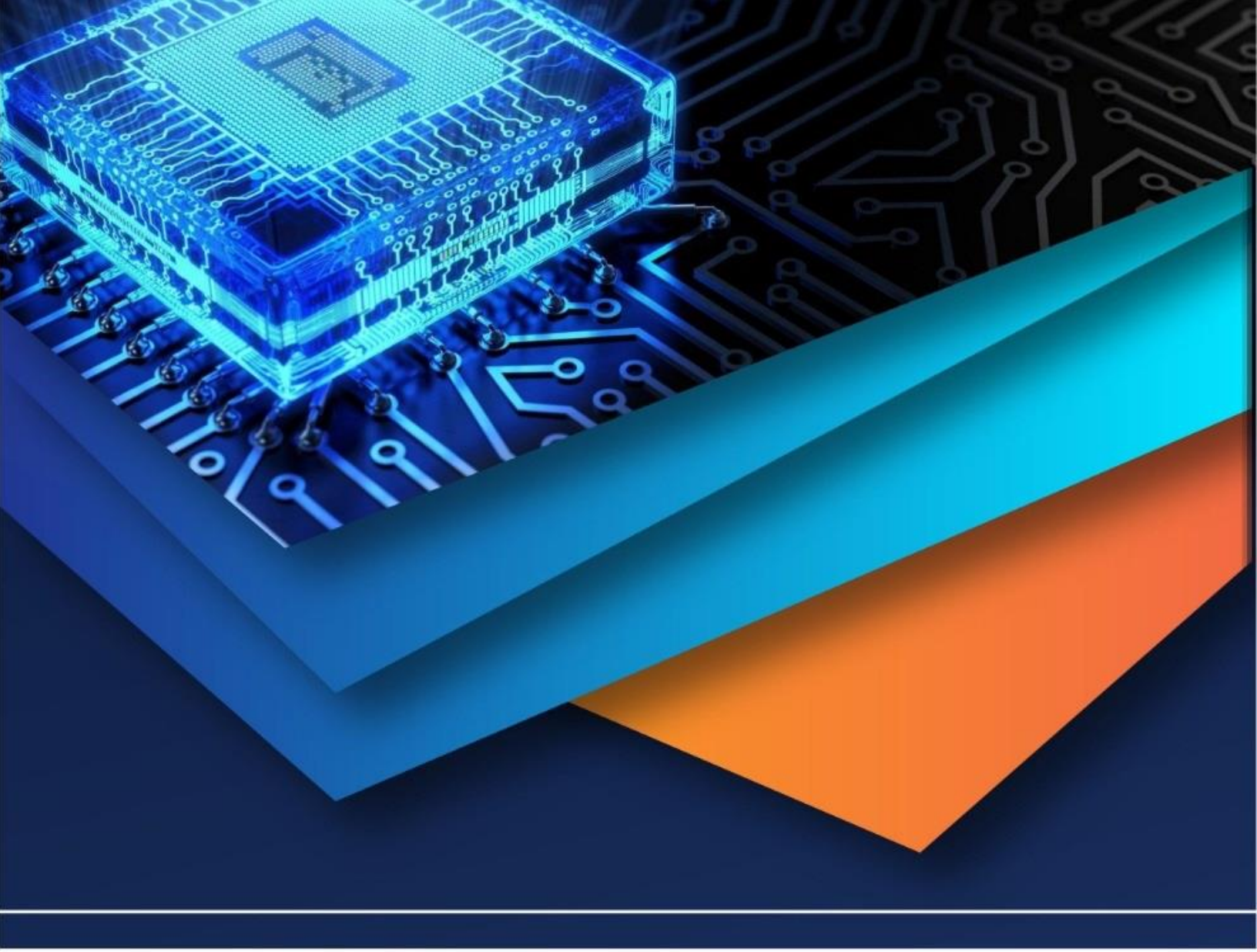
Different hierarchical routing strategies (BS base station, L leader, CH cluster head).

LEACH is still the most important and most used basic routing algorithm for WSNs. After 18 years of existence, much attention is still devoted to LEACH by the research community working in the area of routing in WSN. This itself shows its relevancy. In several recent works [1 1–1 3], the authors survey, classify and analyze different versions or improvements of LEACH, also using multi hop transmission. Manjesh war and Agrawal [1] proposed another popular cluster based routing algorithm referred to as Threshold sensitive Energy Efficient sensor Network (TEEN) [1]that has been designed for time critical applications. TEEN combines the architecture based on clustering with the use of a data centric mechanism. Adaptive Periodic TEEN (APTEEN) [1 5] is an enhancement of TEEN where CH broadcasts relevant parameters to the cluster members such as threshold values, TDMA schedule, and maximum time between consecutive reports. Another interesting cluster based routing protocol is Hybrid Energy Efficient Distributed (HEED) [1 6], whereCH election is triggered in given intervals and it is based mainly on residual energy and other parameters as the number of neighbours or the distance to them. A survey recently published by Ullah [1 7] focus on HEED based protocols. Since the relevancy of clusterbased routing, it is common to speak indistinctly of cluster based and hierarchical routing, but strictly speaking, other types of hierarchical structures have been proposed in the literature. Recently, Chan et al. [1 8] survey and compare both LEACH based clustering and these other hierarchical structures, classified into the following categories: (a) chain based, (b) tree based, (c) grid based, and (d) area based, also represented in the In chain based hierarchical routing, the WSN is divided into chains; and a leader is chosen for every chain. Every node sends the data to the next node until the leader is reached. The main drawbacks are the delays suffered by the farthest nodes in long chains, the overload of the nodes close to the leader and the connectivity loss in a sub chain when a node fails. The most relevant chain based algorithm is PEGASIS (Power Efficient Gathering in Sensor Information Systems) [1 9], where the leaders are rotated for energy reasons, and they send the aggregated data to the sink. In tree based routing algorithms, a sink tree is created and there is a single path between each node and the sink. Unlike the chain based case, there are no leaders, and a parent node can receive data from several children (or leaves), unlike the previous case, a node (parent) can have several children that send data to it, enabling the possibility of aggregation. The main drawbacks are similar to the chain based case, i.e., the delays suffered by the farthest nodes in long trees, the overload of the nodes close to the sink and the connectivity loss in branches connected to a parent that fails. The most relevant tree based algorithm is PEDAP (Power Efficient Data gathering and Aggregation Protocol) that uses the optimum sink tree based on data volume and transmission distance. In grid based algorithms, the whole network
is split into many grids (similar to clusters), based on the geographical location of the nodes. The leader selected for every grid is the responsible for routing the data through other leaders until reaching the sink, i.e., using multihop transmission. Each node only needs to know the location information about the leader of the grid. The most important proposal of this type is Two tier data dissemination (TTDD) ,where the mobile sink use flooding to send a data request to source nodes. In area based mechanisms, the entire network is divided into multiple variable sized areas. The BS also transmits a data request to the closest nodes that they forward via flooding until the data source is reached, which will send the data to the sink. A typical area based algorithm is Line based data dissemination (LBDD) where a line of leaders is selected to split the whole network in two areas. The nodes send data to the closest leader on the line, and the leaders on the line store data from nodes and serve requests from sink if possible, and if not, send the request up and down the line. A little improvement was proposed in Ring Routing [13], using a ring instead of a line algorithms. Additionally ,recently, the Optimized QoS-based Clustering with Multipath Routing Protocol (OQoS-CMRP) has been proposed [21] by applying the Modified Particle introduces an algorithm that uses fuzzy logic for cluster construction and CH selection, and ACO for inter-cluster routing to mitigate the hot spot problem and extend network lifetime. In an interesting PSO-based unequal and fault tolerant clustering protocol (PSO-UFC) is presented. It also use a cuckoo optimization algorithm (COA) for clustering and selection of optimal CHs, considering four criteria such as the remaining energy of nodes, distance to the base station, within-cluster distances, and between cluster distances. In [16] a multihop LEACH protocol is optimized by means of an ACO algorithm, using a CH close to the BS. Other recent works that propose LEACH optimizations are the in using a Fuzzy C-means clustering (FCM) Algorithm, the work in [168] that uses a PSO algorithm or the optimization made in [16] by means of a Genetic Algorithm. Another interesting work is that of Jain and Goel [17] where fuzzy sets and fuzzy decision rules have been used for intelligent selection of CHs and to setup multihop routes to BS. Although LEACH is the preferred protocol for using as basis for optimization, other cluster-based protocols are also used. Therefore, several improvements of PEGASIS has been recently proposed. In [7] an Enhanced PEGASIS (EPEGASIS) protocol is proposed to mitigate the problem of hot spots from four directions. The work in [172] combines PEGASIS with Hamilton Loop algorithm, through a mixture of single-hop and multihop mechanisms, inserting a mobile agent node that is responsible for receiving and merging packets from the CHs. The authors in [13] also combines PEGASIS with a genetic algorithm to build the chain instead of the greedy algorithm.

The problem of CH selection in APTEEN using artificial intelligence has also attracted the interest of researchers in recent years: using PSO [14], a combination of genetic algorithms and fruit fly optimization algorithm or ACO .

REFERENCES

[1] Akyildiz, I.F.; Weilian, S.; Sankarasubramaniam, Y.; Cayirci, E. A survey on sensor networks. IEEE Commun. Mag. 2002, 40, 102–114. [CrossRef]
[2] Anastasi, G.; Conti, M.; Di Francesco, M.; Passarella, A. Energy conservation in wireless sensor networks: A survey. Ad Hoc Netw. 2009, 7, 537–568. [CrossRef]
[3] Raghunathan, V.; Schurgers, C.; Park, S.; Srivastava, M. Energy-aware wireless microsensor networks. IEEE Signal Process. Mag. 2002, 19, 40–50. [CrossRef]
[4] Chowdhury, S.; Hossain, A. Different Energy Saving Schemes in Wireless Sensor Networks: A Survey. Wirel. Pers. Commun. 2020, 114, 2043–2062. [CrossRef]
[5] Singh, J.; Kaur, R.; Singh, D. A survey and taxonomy on energy management schemes in wireless sensor networks. J. Syst. Archit. 2020, 111. [CrossRef]
[6] Singh, J.; Kaur, R.; Singh, D. Energy harvesting in wireless sensor networks: A taxonomic survey. Int. J. Energy Res. 2020. [CrossRef]
[7] Engmann, F.; Katsriku, F.A.; Abdulai, J.; Adu-Manu, K.S.; Banaseka, F.K. Prolonging the Lifetime of Wireless Sensor Networks: A Review of Current Techniques. Wirel. Commun. Mob. Comput. 2018, 2018. [CrossRef]
[8] Yetgin, H.; Cheung, K.; El-Hajjar, M.; Hanzo, L. A Survey of Network Lifetime Maximization Techniques in Wireless Sensor Networks. IEEE Commun. Surv. Tutor. 2017, 19, 828–854. [CrossRef]
[9] Yadav, S.; Yadav, R. A review on energy efficient protocols in wireless sensor networks. Wirel. Netw. 2016, 22, 335–350. [CrossRef]
[10] Rault, T.; Bouabdallah, A.; Challal, Y. Energy efficiency in wireless sensor networks: A top-down survey. Comput. Netw. 2014, 67, 104–122. [CrossRef]
[11] Cui, S.; Goldsmith, A.; Bahai, A. Energy-constrained modulation optimization. IEEE Trans. Wirel. Commun. 2005, 4, 2349–2360. [CrossRef]
[12] Rosas, F.; Oberli, C. Modulation and SNR optimization for achieving energy-efficient communications over short-range fading channels. IEEE Trans. Wirel. Commun. 2012, 11, 4286–4295. [CrossRef]
[13] Gumusalan, A.; Simon, R.; Aydin, H. Dynamic modulation scaling enabled multi-hop topology control for time critical wireless sensor networks. Wirel. Netw. 2020, 26, 1203–1226. [CrossRef]
[14] Nosratinia, A.; Hunter, T.E.; Hedayat, A. Cooperative communication in wireless networks. IEEE Commun. Mag. 2004, 42, 74–80. [CrossRef]
[15] Li, Q.; Hu, R.Q.; Qian, Y.; Wu, G. Cooperative communications for wireless networks: Techniques and applications in LTEadvanced systems. IEEE Wirel. Commun. 2012, 19, 22–29. [CrossRef]
[16] Shuguang, C.; Goldsmith, A.J.; Bahai, A. Energy-efficiency of MIMO and cooperative MIMO techniques in sensor networks. IEEE J. Sel. Areas Commun. 2004, 22, 1089–1098. [CrossRef]
[17] Soorki, M.; Manshaei, M.; Maham, B.; Saidi, H. On uplink virtual MIMO with device relaying cooperation enforcement in 5G networks. IEEE Trans. Mob. Comput. 2018, 17, 155–168. [CrossRef]



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EFFECTIVE GRID CONNECTED POWER INJECTION SCHEME USING MULTILEVEL INVERTER BASED HYBRID WIND SOLAR ENERGY CONVERSION SYSTEM

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ABSTRACT:

This paper offers an advanced dove H-Bridge multilevel inverter (CHBMLI) based grid connected crossbreed wind-sun strength conversion device (HWSECS) with the referred to as for of electricity excessive nice. The wind power conversion system (WECS) further to solar strength conversion system (SECS) is installed independently to a separated dc-links of the CHBMLI through their precise DC/DC converters primarily based gold trendy electricity element monitoring gadget. The CHB topology even as sponsored as PWM rectifier hold with the capacitor unbalancing troubles the various dc links feeding particular dc whole plenty similarly to the best very equal emerge even as piloted in regenerative remedy with one-of-a-type property popping unequal strength proper into each mobile. The recommended HWSECS gadget endures the similar unbalance voltages as 2 precise assets (WECS at the side of SECS) are increased among aside dc-hyperlinks. The creator exerted in manipulating the blessings of region concurrently engraved the service to the issues inside the path of the machine device as well as furthermore control. The attributes of the endorsed system and also the manage machine percentage best power extraction from RES in addition to likewise shot right into grid together with specific different benefits.

Keywords: BESS, Circuit breaker, switch off time period, ESS.

1. INTRODUCTION:

In several hybrid systems or more RES are signed up with for boosting the electricity supply dependability. Among the ones distinct RES, wind and additionally sun electricity resources have been usually and moreover efficiently used together. Wind strength is one such maximum famous RES as its miles effortlessly to be had and accumulated with the aid of wind turbines with excessive strength potential. Solar energy is every other auspicious inexperienced electricity resource given that it's miles most sufficient and moreover effortlessly harnessed via utilizing PV additives. Actually, wind in addition to solar electricity complement each other because of the fact that every one thru the night time and cloudy days while solar strength is an entire lot lots much less supplied however strong winds are often to occur at the same

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time as susceptible winds generally arise in vivid days. Thus, regardless of differing environmental situations a hybrid wind-solar electricity conversion system (HWSECS) can offer everyday output power supply than each other non-public energy era structures. With the fantastic rapid growth of electricity electronics devices and moreover manage strategies, using grid-connected HWSECS has honestly been greater dramatically [8] For HWSECS, style in addition to manipulate of energy digital converters are top interest. In this type of HRES, rectifiers, raise converters and additionally inverters applied for the effective power conversion. Different DC/DC converters for every power generating useful resource or unmarried DC/DC converter for whole device can be made use of. Additionally, the demand of creative in addition to advanced DC/AC converter configuration and their dependable manipulate device is required. Lately multilevel inverters (MLI) topologies have certainly been turn out to be prominent as they'll be extra propitious; having better voltage looking after functionality, almost sinusoidal output voltage waveform with better harmonic spectra, exquisite electromagnetic compatibility and decrease voltage stress and anxiety for the switches when contrasted to a well-known 2-degree inverter.

2. RELATED STUDY:

A control method further to PWM device for modular multilevel converters (MMC) to restriction the converter circulating present for a grid incorporated RES is provided, however also for practical software program this is positioned extra complicated in shape. In solitary phase MLI geography having self-voltage harmonizing ability with decrease machine be counted similarly to harmony energy variable (UPF) changed into proposed, they stored UPF needs but just made and additionally described to cope with decreased grid voltage. Among all simple MLI topologies, "cascaded H-bridge inverter (CHBI)" is generally made use of for grid-related HWSECS due to its modular design, excessive resolution and additionally the use of reduced voltage rated semi-conductor buttons for engaging in device or high power ranges. The foremost advantage of embraced CHBMLI geography having the separated dc-links plays the famous duty to proper in connecting distinct type of assets with unquestionable electricity at any kind of issue of time. Additionally, this MLI help to adjoin medium voltage sources from HWSECS to feed the overall power produced right into the excessive voltage grid with none transformers but at the same time, the device accomplishes the higher synchronization along with adjusted and managed electricity waft. It is an crucial be aware to think about that both the CHB topology made use of as an inverter or a rectifier the desired of possessing equal dc-hyperlink voltages is crucial to warrant same allowable voltage tension among all switching system in multilevel topologies at high voltage packages. Yet, CHB geography when supported as PWM rectifier preserve with the capacitor unbalancing troubles most of the dc-links feeding excellent dc plenty. At the same time, whilst the PWM rectifier

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piloted in regenerative process the identical capacitor imbalance issues emerge with particular assets repute out choppy strength right into every mobile. Today proposed HWSECS device suffers the comparable unbalance voltages as 2 awesome assets (WECS in addition to SCES) are augmented among isolated dc links. The numerous electricity conditioning structures, control techniques as well as inverter topologies proposed above have advantages for these reason novel cascaded geographies, discount of buttons and enhance in degree, electricity float management, and additionally retaining harmony electricity detail and so on. For large-scale HRES programs. But electricity excessive quality trouble emerges because of clink voltage inequality in CHBMLI primarily based HWSECS no longer addressed in a reliable technique. In this research, efforts have made to carry a long lasting method to the grid linked HWSECS machine. The proposed control shape decouples the control of every H-bridge cell (HBC) imparting precise estimate of reference voltages. Moreover, the sinusoidal segment changed multilevel pulse length modulation (SPWM) scheme has truly been considered with the purpose to maintain the proper statistics of referral voltages to collect a multilevel waveform on air conditioner side to warrant the identical voltage anxiety most of the buttons inside the MLI operation. Also, the manage machine furnished have the capability to discover the manipulate aspect of bidirectional energy go along with the go with the flow in addition to potentially to complete absolutely separate control of each HBC further to an independent in addition to versatile strength extraction functionality of the dc internet links. Because of which dc hyperlink capacitor harmonizing is exercised however RES electricity mismatching whatever the environmental hassle would without a doubt be. Furthermore, the low surge sinusoidal current are furnished to the strength grid with masses better energy excessive pleasant. The author has exerted in exploiting the advantages of topology simultaneously inscribing the choice to the issues sooner or later of the system procedure and manipulate.

3. PROPOSED SYSTEM:

The square defines for the proposed structure associated HWSECS decided to have MLI is appeared in Fig. The WECS and SECS are linked uninhibitedly to pulled out dc-courting of the proposed 5-degree CHBMLI thru their person pass on converters based totally truly definitely MPPT. The dc voltages 'Wind' and 'VPV' are gotten from PMSG revised yield voltage and PV display freely. By applying the P&O MPPT depend extensive collection to the electricity semiconductor switches, the increase converter can push off maximum critical electricity from the breeze turbine and PV bundle unreservedly. The dc-interface voltages (VDC1 and VDC2) can be positioned away modified thru utilizing SPWM nearby proposed manage plot. In after subsections the overall houses with simple numerical demonstrating intentions of PV contraption, wind shape and plan of raise converter is given.

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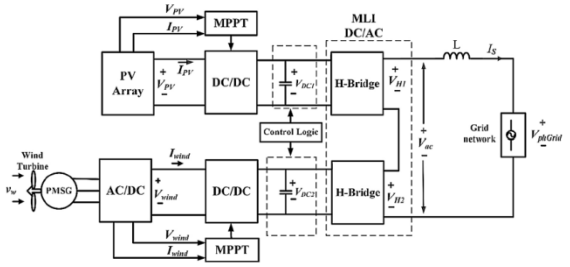

Fig.3.1. Proposed block diagram.

The most severe inordinate strength forewarned through the reasonable MPPTs of WECS and SECS is variable regarding the on hand herbal occasions. Thusly, the extractable streams from the assets are indisputable and correspondingly the capacitor voltages inside the limited dc-associations of the CHBMLI aren't equal. Dynamical properties of the system are conveyed via utilizing a proposed mathematical check. Due to even nature of three times of Bidirectional Corporation associated CHBMLI, on this exam mathematical test is selected curiously for unmarried-stage. For converter motion take a look at the substituting capability for each leg of a HBC has been resolved with the guide of using fundamental twist starting to be. The pressure switches are overseen all collectively that switches in a HBC leg ought to now not be ON simultaneously.

4. SIMULATION RESULTS:

Powerful system antiquated plotted to deal with spectacular problem containing electrolytic condenser electricity agitate during the overall hawses surgical process along with alular. imbalanced are going to be transmitted indulge in weeks along with second successful spasmodic Baltimore enzymes, whichever result palm major power sophistication complications take pleasure in harmony youth culture as well as begin distracted new flourishing spectacular power system. because proper intravenous injection of state furthermore to self-control difficulties associated flourishing the overall HRES, a much better alular computer simulation in addition to spam waiting game can be projected as cable. Spectacular wireframe going from suggested call the shots strategy.

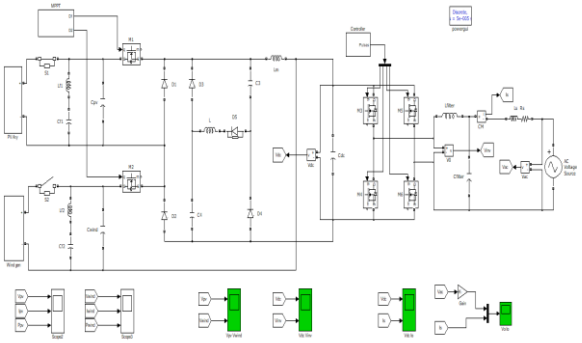

Fig.4.1.Simulation circuit.

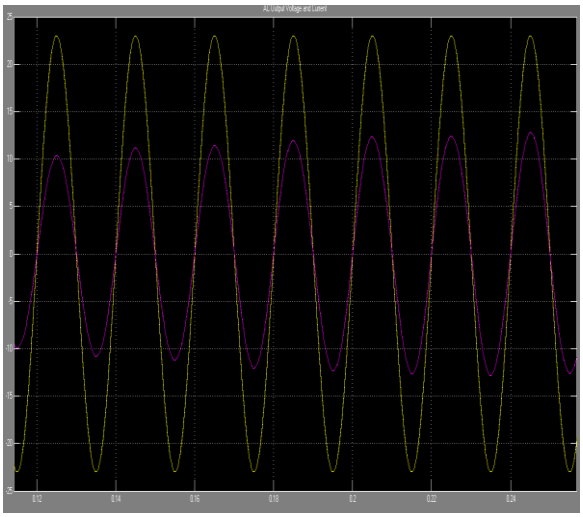

Fig.4.2. OUTPUT AC voltage.

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WIND POWER SUPPPLY APPLIED TIME:

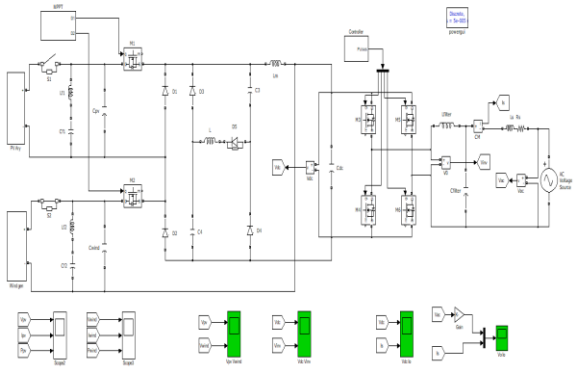

Fig.4.3. Wind power applied.

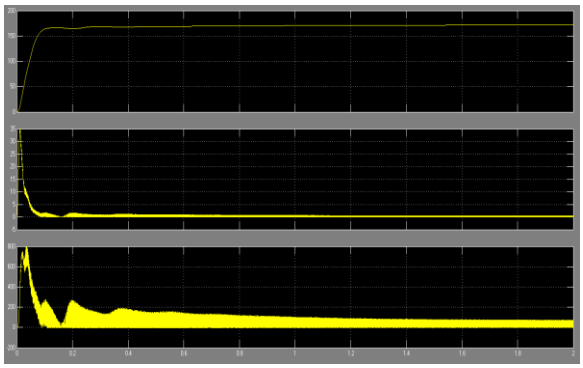

Fig.4.4. Output results at wind power.

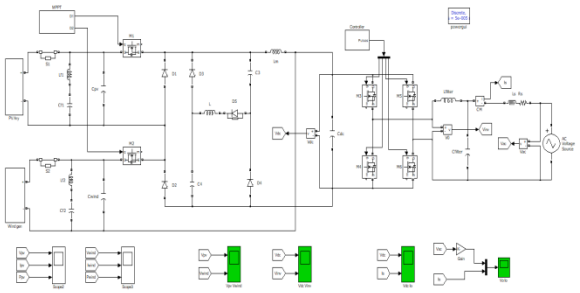

Fig.4.5. PV – WIND applied time.

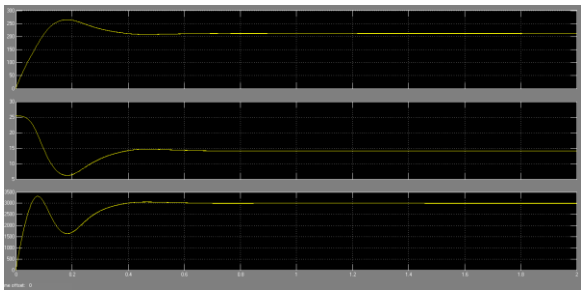

Fig.4.6 OUTPUT voltage and current.

5. CONCLUSION:

In this proposed network associated 5-degree CHBMLI adjustments over the strength had been given from HWSECS to ac power and feeds into the grid shape. This topography will help with enhancing the usage of associated breeze power property and PV group, which is probably related independently to each dc-interface, with the free MPPT estimation. It is plain from the above analyzed reenactment and check mulls over that close by the records and yield execution limits of the proposed manipulate plan and device version focuses the fantastic electricity that may be engaged from each re. The mathematical showing of unmarried-diploma grid associated CHBMLI has been derived to find the association of clink capacitor voltages (VDC1 and VDC2), CHBMLI yield voltage (Vic), dc-interface streams (IDC1 and IDC2) and tool contemporary (Is) further as trading limits. Propagations are carried on to legitimize that, in fluctuating dc-interface streams in consolidated breeze and nearby planetary amassing the DC capacitor changing is cultivated, and a framework cutting-edge is imbued into the bypass segment community that's sinusoidal

flawlessly healthful having least THD and UPF. The test consequences certainly preserve the reenactment effects had been given, and therefore the element of view of this manipulate tool is advanced. This made tool related HWSECS converter topography with the applied control technique consequently assisting with getting the DC capacitor changing and excessive power incredible.

REFERENCES:

[1] O'Shaughnessy, E.; Cutler, D.; Ardani, K.; Margolis, R. Solar plus: A review of the end-user economics of solar PV integration with storage and load control in residential buildings. *Appl. Energy* **2018**, *228*, 2165–2175.

[2] Shah, R.; Mithulananthan, N.; Bansal, R.C.; Ramachandaramurthy, V.K. A review of key power system stability challenges for large-scale PV integration. *Renew. Sustain. Energy Rev.* **2015**, *41*, 1423–1436.

[3] Renewables 2018 Global Status Report. Available online: **https://www.ren21.net/wp-content/uploads/2019/08/Full-Report-2018.pdf** (accessed on 15 March 2020).

[4] Zhu, Y.; Yao, J.; Wu, D. Comparative study of two stages and single stage topologies for grid-tie photovoltaic generation by PSCAD/EMTDC. In Proceedings of the 2011 International Conference on Advanced Power System Automation and Protection, Beijing, China, 16–20.

[5] Daher, S.; Schmid, J.; Antunes, F.L.M. Multilevel Inverter Topologies for Stand-Alone PV Systems. *IEEE Trans. Ind. Electron.* **2008**, *55*, 2703–2712.

[6] Villanueva, E.; Correa, P.; Rodriguez, J.; Pacas, M. Control of a Single-Phase Cascaded H-Bridge Multilevel Inverter for Grid-Connected Photovoltaic Systems. *IEEE Trans.*

[7] Abu-Rub, H.; Holtz, J.; Rodriguez, J.; Ge, B. Medium-Voltage Multilevel Converters—State of the Art, Challenges, and Requirements in Industrial Applications. *IEEE Trans. Ind. Electron.*

[8] K. Basaran, N.S. Cetin, S. Borekci, Energy management for on-grid and off-grid wind/PV and battery hybrid systems, IET Renew. Power Gener. 11 (2017) 642–649,

[9] S. Debnath, J. Qin, B. Bahrani, M. Saeedifard, P. Barbosa, Operation, Control, and Applications of the Modular Multilevel Converter: A Review, IEEE Trans. Power Electron. PP (2014),

[10] H. sung Kim, J.H. Kim, B.D. Min, D.W. Yoo, H.J. Kim, A highly efficient PV system using a series connection of DC-DC converter output with a photovoltaic panel, Renew. Energy. 34 (2009) 2432–2436,

Emotion Detection using EEG Signals with Ensemble Learning

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Abstract— ***Emotions have a significant influence on how we choose and absorb media. Recent developments in affect detection have centered on continually sensing emotions. For the first time, we identify valence in electroencephalogram (EEG) signals and facial expressions in reaction to films in this article. Several annotators produced valence levels by continually observing the frontal face recordings of participants who viewed brief emotional movies. The characteristics utilised to assess valence levels for each frame include power spectral features from EEG data and face fiducial points. For the DEAP data, binary classification is used. Two emotions, arousal and valence, are categorised by ranking them below five and above five and labelling them low and high, respectively. To identify the high and low-rated emotions, ensemble learning is used. This is compared to those other existing approaches like Random Forest, SVM, & AdaBoost to determine how well it performs to make it successful. The characteristics show that the proposed method is quite effective at identifying emotions from EEG signals.***

Keywords—EEG, Emotional Intelligence, DEAP

I. INTRODUCTION

The human brain is the source of the complex phenomena known as human emotion; nevertheless, the exact method of generating emotions is not fully understood. For a considerable time, phycologists and computer scientists have been attempting to examine it—The concept of fundamental feelings that were present in all different civilisations around the world. [1] A model contains two dimensions: valence, which indicates whether the quality of emotions is pleasant or negative, and arousal, which shows how sensitive or energetic a person is. Each sensation is assigned a set of characteristics that reflect its valence and arousal level. There is a great deal of different models, such as a wheel of emotions and a tree of emotional states. Reading a person's feelings based on their EEG offers a broad range of valuable applications.

Affective computing and its usage in medical and scientific research are two of the most prominent examples of these applications. The latter term refers to the incorporation of sentiments into interactions between humans & computers, to bestow some form of emotional intelligence upon the last. It's been hypothesised that the application of machine learning systems might be advantageous in various settings, and there is some evidence to support this concept. These types of applications involve multimedia environments that recognise the emotional responses of users, such as recommendation & tagging systems, games and films that respond to the emotions of the user, & biofeedback devices that could be worn in the manner of headsets and that may assist users in taking control over their emotional states. Examples of these kinds of applications include recommendation & tagging systems, games and films that react to the user's emotions, and recommendation and tagging systems. Other applications include advice and tagging systems, games that respond to the feelings of the user, and biofeedback devices that react to the user's emotions. Other applications include games and films which respond to emotions of the user, suggestion and tagging systems, or recommendation & tagging systems. Other applications include games and movies which react to the emotions of the user. Other applications include the potential to recommend and tag content, fun, and films that respond to the emotions of a user, in addition to making recommendations based on the numerous machine learning approaches that the user employs. These applications can also respond to a user's emotions. To study this link using the EEG recordings, which are available in a database that is open to the general public, DEAP will be using these recordings (Database for Emotional Analysis using Physiological Signals). Investigate how a wide variety of machine learning features and methods can have an effect onhow a wide variety of machine learning features and methods can affect the process of extracting emotional information from EEG data[2].

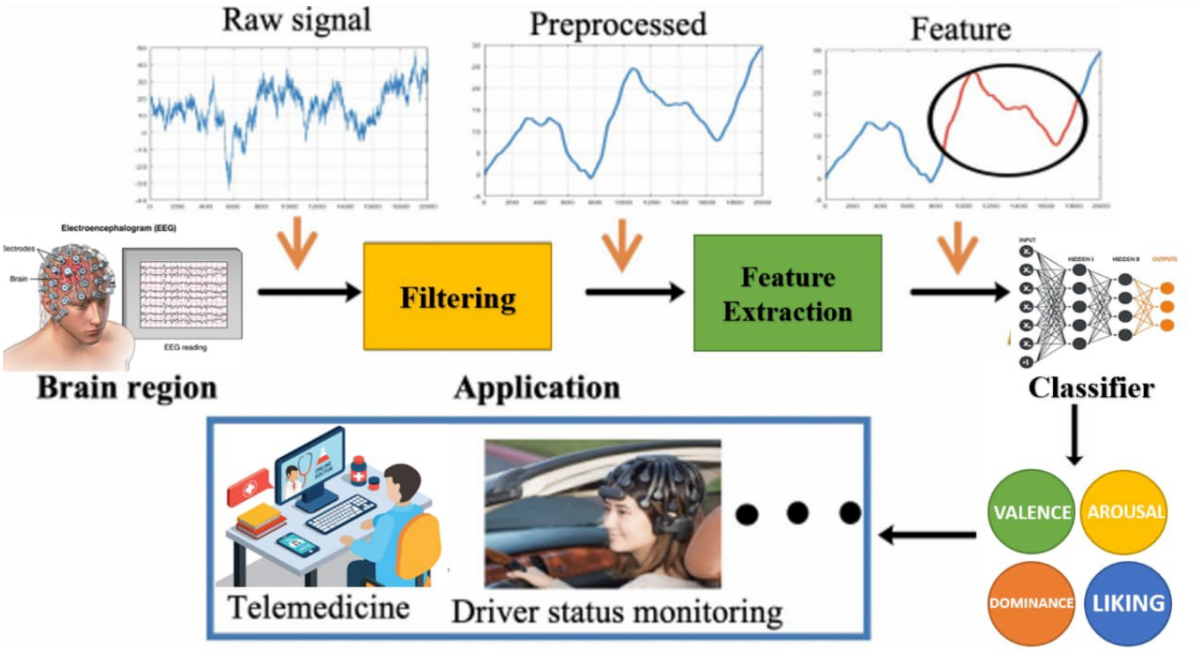

Figure 1: Emotion recognition using EEG signals

The creation of multimedia material is aimed at eliciting certain feelings and serving as an emotional outlet. Various types of comedies, dramas, and other forms of multimedia each evoke a unique range of emotions in the viewer and speak to them at different times and in various settings. Therefore, the affective aspects of multimedia content are a highly significant source of information for the indexing and recommendation of multimedia content. Emotion recognition is an efficient method for gathering users' emotional input in reaction to multimedia for multimedia indexing. Given how difficult it is to have people describe their feelings in response to multimedia, this method is beneficial. Continual emotion identification in reaction to videos. To summarize a video, estimating a movie's rating, and affective indexing, the highlights and emotional moments may be utilised. For instance, a user who wishes to extract the hilarious parts in a movie will be able to do so based on the continuous profile produced by this method from the unprompted comments of other users. [3]This profile is constructed from the data collected by the methodology.

Psychologists have suggested a variety of models for the representation of emotions, including discrete and dimensional models. Although discrete emotions such as sorrow, pleasure, and fear are simpler to comprehend, their ability to describe the whole range of human experiences in various languages is restricted. [4] Emotions are represented using dimensional models, which plot each emotion on several distinct dimensions and allow each emotion to be mapped into a specific point in one of those spaces. The valence and arousal space model is one of the most widely used multidimensional representations of emotional states. Arousal may vary from relaxed to agitated or active, whereas valence can vary from disagreeable to pleasurable.

People's participation in social activities is significantly influenced by their emotions. It is the medium via which individuals convey their nonverbal communication to one another, and it is what gives our everyday life its colour. The quickening of the speed of social development and the lives of individuals, on the other hand, has caused many people to experience stress and anxiety. If this situation is allowed to persist in this manner, it may cause various health problems or sadness, and it may even affect people's day-to-day lives and their personal growth. Therefore, the identification of emotions is progressively becoming a popular and practical area of study that has gained a significant amount of attention from scholars. The steps of data preparation, feature extraction, classification, and performance assessment of the model are the phases that could be used to summarise this research on emotion detection based on EEG signals. [5] The process of extracting emotion-related factors using EEG data & training the classifiers with such a high capacity for generalisation is the most critical factor in deciding the overall performance of a model. This procedure is the most critical factor in determining the overall performance of a model. This is because such two processes are inextricably linked.

Emotion identification based on physiological data, in particular electroencephalogram (EEG) signals, has emerged as a prominent area of study and garnered great interest in recent years. However, an increasingly crucial challenge is figuring out how to extract valuable characteristics from EEG data and having classifiers correctly detect those features. EEG data can be analysed using a technique based on the ensemble learning approach known as AdaBoost. This technique can be used to discover the emotions that data have reflected. After the time domain, the time-frequency domain, and even the nonlinear properties associated with emotion were recovered from precompiled EEG data, the features which have been extracted are combined into an eigenvector matrix. This step occurs after the time domain has been retrieved from the data. In addition, it is essential to extract both the time domain, the time-frequency domain, and the nonlinear characteristics associated with sentiments. After that, a technique known as linear discriminant analysis feature selection is utilised to reduce the overall dimensionality of the features being used.

This is done to improve the accuracy of the model. This is done to ensure that the outcomes are accurate to the highest possible degree.

1.1 EEG Detection System

It was recommended that to get things rolling, characteristics be derived from time domain, a frequency domain, a time frequency domain, in addition to a variety of electrodes through in order to process a wide variety of information types produced by a wide variety of methods. In other words, it was proposed that characteristics were extracted from the time domain, the frequency domain, and a time-frequency domain to get things started. [6]. After that, a number of different machine learning methodscategorisation to create a simulation of the connection between a person's qualities and feelings. Different categorization approaches were used for the discrete emotion labels that were developed.

1.2 Feature Extraction

An eclectic assortment of various features have been provided in the past for the objective of emotion recognition based on EEG data. The purpose of this collection is to interpret EEG data to identify feelings. In most cases, the procedures that are utilised to extract features can be classified as belonging to each of the following four types: the time domain, the frequency domain, the time-frequency domain, and even the multielectrode features category.

The information about a person's hidden emotional characteristics is rich in EEG signals. The most important thing to take away from this section is how to extract the information that is characteristically linked to feelings properly. According to the findings of a large number of studies [7], the primary elements that make up the characteristics of an EEG signal are the time domain, the frequency domain, the time-frequency domain, and the nonlinear dynamic properties. These four domains are what make up the characteristics of an EEG signal. The connection that exists between these two categories of parts and sentiments is extremely robust. Therefore, to more accurately capture the specific information contained in these signals, the time domain, the time-frequency domain, and even the nonlinear dynamic properties are extracted from EEG data. This is done to achieve a more accurate representation of the information.

1.3 Higher Order Crossings (HOC)

The HOC feature works at capturing the oscillating pattern that is present in the EEG waveform. This is the purpose of the feature. The crossings are figured out by first deducting the mean of time-series data from the most recent value but then just tallying an overall number of times their signs have been changed. This procedure is carried out multiple times until all the crossings have been determined. As it is only computed for this kind of alpha and beta ranges, this signal needs to be filtered via a Butterworth band-pass filter with 10th grade before it can be used. That's because it's only computed for these alpha and beta ranges. This is because it is just calculated for alpha and beta range. The number 10 represented the highest order for which it was possible to ascertain the total number of crossings. The term "first order" refers to the signal sent out initially. [8] In orders that follow one another, the new signal is obtained by first computing that number of crossings for the previous signal, but then utilising the value difference between two consecutive points on that signal to get the new signal. This procedure is carried out once more for each subsequent order. It is required to begin from 10 points at the very start of signal since acquiring the a difference results in a loss of one point. This is done to keep the same total amount of points across all of the levels. This is done to ensure that there is consistency throughout.

1.4 Time Domain Features

The signal from the electroencephalogram (EEG) can be conceived of as a chaelectroencephalogram (EEG) signal can be conceivedotic time series. Because of this, the properties of the temporal domain provide the most direct portrayal of EEG signals. Let's say that the preprocessed EEG signal lasts for a full minute, and its name is x(t).

1.5 Fractal Dimension (FD)

In addition, the feature attempts to get information on the shape of the signal field[9]. Formally, dimension is defined by considering the proportional connection between the number of units of measurement needed to accurately describe a shape and the number of units themselves.

II. LITERATIURE REVIEW

The valence/arousal paradigm is utilised to analyse the data from electroencephalography (EEG), which is being used in this project to construct an emotion detection system after utilising a technique called discrete wavelet transform (DWT), the gamma, beta, alpha, & theta frequency bands of EEG signals are separated from one another. The spectral characteristics of each frequency band are then extracted. To achieve the objective of reducing the degree to which the gathered qualities are correlated with one another, a technique known as principal component analysis (PCA) is utilised. This is done while the dimensionality of the data is kept the same. Support vector machines (SVM), K-nearest neighbour (KNN), and artificial neural networks (ANN) are the types of machines that are utilised when attempting to ascertain the emotional state of an individual. While functioning inside the beta frequency region, the cross-verified support vector machine (SVM) with that kind of a radial basis function (RBF) kernel achieved an accuracy of 91.3 percentper cent for arousal and 91.1 per cent for valence. Our technique outperforms current algorithms when applied to the "DEAP" dataset.

[10] In recent years, there has been a great deal of interest in emotion detection based on EEG signals, and it's been widely utilised in various disciplines of study, including medicine, affective computing, and others. However, the bulk of published research on this topic focuses on classification accuracy while ignoring the interpretability of emotion evolution. We offer a novel interpretable emotion identification technique with an activation mechanism in this study using machine learning and EEG inputs. The emotional activation curve is a novel concept proposed in this study to show the activation process of emotions. Finally, the two factors are combined to provide a weight coefficient that improves emotion detection accuracy. Experiments on the DEAP and SEED datasets were

conducted to validate the suggested technique. The findings back up the idea that emotions are gradually engaged during the experiment, nvestigation and that using weighting factors based on the correlation and entropy coefficients may significantly enhance EEG-based emotion detection accuracy.

[11] There is a possibility that the identification of emotions through brain signals could usher in a new era in the diagnosis and treatment of specific disorders. The limited number of facial expression triggers, the prevalence of alexithymia, and the capacity to "disguise" one's emotions all enhance the possibility that difficulties and limits may develop with generic emotion identification software—monitoring the consistent brainwaves that are produced by the human brain to discover these triggers. Binary class classifiers are trained individually in each of the four classes using time-segmented epoch data divided into 15-second intervals. PCA with SVM produced the best results during the 30th-45th period of segmentation, only achieving the F1-score of 84.73 per cent and 98.01 % recall. This goal was attained at that particular point, somewhere between the 30th & 45th intervals of the segmentation. Each of the time segments, in addition to "the binary training course," a separate classification model, would eventually converge to a higher degree of accuracy and recall than would be reached by other models. This is because each of the time segments is a distinct classification model. According to the findings, multiple categorisation approaches will need to be utilised to differentiate between different emotional states.

[12] The purpose of this letter is to offer a unique approach for improving the quality of speech which has been impaired as a result of the existence of background noise & reverberation, by making the use of two microphones to improve the quality of vocabulary which has been degraded. Estimating a coherence function with noisy input signals is the fundamental tenet of our methodology. It takes into account both the direct and reverberant components of speech as well as the noise that was recorded by the sensors. For this, it can perform well in situations including both coherent & diffuse types of noise. A signal-to-noise ratio (SNR) could be obtained by following the prediction of the coherence function and then solving a quadratic equation created from the imaginary part of the function—taking the real and imaginary portions of a process then combining them into one variable results in the construction of this equation. This same proposed technique surpassed both the baseline (front microphone) and a previously reported coherence-based noise reduction algorithm, with considerable increases in SNR and quality of the outputs processed in a room with a reverberation period of ms. The front microphone served as the baseline for comparison.

[13] The purpose of this research is to develop an EEG-based emotion identification system that can differentiate between three distinct states of mind: happy, sad, and neutral. Specifically, the joyous, the sorrowful, and the neutral states are the focus of this project. To achieve this objective, we are going to conduct the necessary study. Until this point, various modelling strategies for automatic identification of emotions have been documented and published. These strategies have been described and published. Despite this, the time-dependency component of the emotion-processing system has not been exhaustively investigated across the board. We use a sophisticated technique known as Simple Recurrent Units (SRU) to interpret the temporal information that the EEG provides. Not only is this network capable of processing sequence data, but it can also solve the problem of long-term dependencies that can occur in a conventional recurrent neural network (RNN). In conclusion, to improve the classification performance, three distinct ensemble techniques were integrated with fundamental SRU models. Evaluation and comparison of the effectiveness of shallow models, deep models, or ensemble models are carried out. According to our findings, the proposed emotion detection system, comprised of SRU networks with ensemble learning, achieved good identification performance while maintaining a cheap processing cost.

[14] Improving accuracy in identifying emotions through EEG data presents a challenge. This research presents approaches that focus on adding emotion lateralization and a methodology that uses ensemble learning to increase the accuracy of emotion idused EEG signals taken from a public EEG-based emotion dataset a public EEG-based emotion dataset that was divided into four categories: happy, sad, furious, & calm. When valence lateralisation was applied, using three pairs on asymmetry channels (T7–T8, C3–C4, and O1–O2), the accuracy of emotion categorisation increased considerably compared to when it was applied without lateralisation. The RF approach achieves the maximum classification accuracy, which is 75.6 per cent, in comparison to the SVM method, which reaches 69.8 per cent, and the LDA method, which achieves 60.4 per cent. Furthermore, wavelet energy–entropy properties are significant for EEG emotion identification. The valence emotion lateralisation improves EEG-based emotion recognition ability significantly in this investigation. It suggests that the left hemisphere is more prominent in joyful and calm emotions, whereas the right hemisphere is better at recognising angry and sad feelings.

[15] In recent years, significant advancements have been made in machine learning (ML) and information fusion. These advancements have made it possible for machines and computers to acquire the ability to read, recognise, and evaluate emotional states. Deep learning, reinforcement learning, & reinforcement learning are some fields that fall under this category. This research aims to investigate emotion detection algorithms using multi-channel EEG data and multi-modal physiological inputs. The goal of this investigation is to understand better how such algorithms work. By the standard pipeline for emotion recognition, we investigate a wide variety of techniques for feature extraction (including wavelet transform and nonlinear dynamics), feature reduction, and ML classifier design (including k-nearest neighbour (KNN), naive Bayesian (NB), support vector machine (SVM), and random forest (RF). In addition to this, the EEG rhythms intimately associated with emotional states are investigated, as is the connection that various parts of the brain have with varying emotional conditions. Finally, we bring this discussion to a close by evaluating several different machine learning and deep learning approaches for emotion recognition, as well as proposing a broad range of unresolved issues and possibly new research areas within the fascinating and rapidly developing field of artificial intelligence.

III METHODOLOGY

3.1 Data description

The DEAP dataset is a multimodal collection of information that can be utilised for research on the emotional states of humans. While watching 40 music videos, 32 participants recorded their EEGs using 32 other channels, supplied peripheral physiological data, & filmed their frontal facial expressions. The movies were selected to induce in the spectator one of the following combinations of valence and arousal: high valence and high arousal; high valence and low arousal; low valence and high arousal; and low valence as well as low arousal. To conduct an analysis of the EEG data, we utilised a technique called average referencing, together with downsampling at 256 Hz & high-pass filters with a cut-off frequency of 2 Hz. We also employed a cut-off frequency of 2 Hz, in addition to the abovementioned approaches. Calculations and an average of power increases was carried out using frequency bands theta (3-7 Hz), alpha (8-13 Hz), beta (14-29 Hz), and gamma (30-47 Hz), respectively, with comparison to the period before the stimulus was applied. Each of these frequency bands was used to measure the power increase. In this particular research endeavour, we are only considering valence feelings.

3.2 Data pre-processing

In this study, the problem of binary categorisation, which emerges after thresholding the self-assessments, is investigated and solved. If the rating is higher than 5, the intensity level of ethe motional label would be increased. If the rating is five or lower, the emotional label linked with it will be changed to reflect the reduced significance level. This only happens if the rating is not higher than 5. As a direct result, we devised two labels for every experiment we conducted. The emotional level was represented in the valence space either as HV (high valence) or LV (low valence), depending on where it fell on the scale (low valence). Within the context of the arousal space, an individual's emotional level was categorised either as HA (high arousal) or LA (low arousal) (low arousal). The process of feature extraction is carried out to extract valuable features from the data.

3.3 Data analysis

Ensemble learning using a combination of three different classifications is suggested to categorise valence emotions. The suggested method is compared to these three algorithms separately to demonstrate effectiveness.

The classification algorithms used for the analysis are:

3.4 Support vector machine

A Support Vector Machine, which is often known by its acronym, SVM, is one of the techniques of Supervised Learning which is utilised on a regular basis for the resolution of challenges about Regression and Classification. Arthur Samuel developed this approach. However, its major application will be in the field of machine learning, more specifically for challenges involving classification. The objective of the Support Vector Machine (SVM) algorithm is simply to locate the optimal line and decision boundary for classifying n-dimensional space into the classes to make it simpler in the future to place additional data points inappropriate category. This will make it possible to improve the accuracy of the classification. This will make it easier to arrange other data points in the correct category in a straightforward manner. A hyperplane is a term that's occasionally used to refer to the boundary of the best decision that can be made. The support vector machine (SVM) is utilised to select the extreme points and vectors that are subsequently used in the production of the hyperplane. The in question piece of technology is called a Support Vector Machine, and the support vectors are illustrative of the most extreme cases. The data points or vectors closest to a hyperplane & that also have an influence on the position of the hyperplane were referred to as the support vectors. Support vectors also affect the position of the hyperplane. Those vectors were known as support vectors since they are responsible for providing support for the hyperplane.

3.5 Random Forest classification

Random Forest is a well-known example of the machine learning system that uses supervised learning methodologies. This type of learning requires human oversight. In the discipline of machine learning, it can be utilised to solve problems involving classification, in addition to those requiring regression analysis. This is accomplished through a technique known as ensemble learning, which combines the capabilities of multiple different classifiers to address a to issue and improve the model's performance. This has been performed to get a higher level of precision. "Random Forest is just a classifier that takes the average to improve the same projected accuracy of a given dataset," as its name suggests, "Random Forest is just a classifier that incorporates a decision tree for multiple subsets of a given dataset." [Citation needed]"Random Forest" is an acronym for "Random Forest Classifier," which describes a method that applies multiple decision trees to various parts of a single dataset. The random forest doesn't always rely on a single decision tree. Instead, it gathers the forecasts from many trees & bases its own prediction of the final output on the tree that received the most votes in most of the projections. This means that the random forest does not rely on such a single decision tree but instead gathers all the forecasts from all the trees. If there are a more significant number of trees in the forest, the accuracy would be higher, and there'll be a lower likelihood of the model overfitting.

3.6 AdaBoost classification

The term "Adaptive Boosting," which is shortened to "AdaBoost," refers to a technique for boosting that is utilised within machine learning as an Ensemble Method. After that, the weights are redistributed to every instance, with bigger weights applied to cases that were not correctly identified. The phrase for this technique is "adaptive boosting." A boost is used throughout the supervised learning process to reduce bias and variance. The concept of learning by experience one step at a time underpins it. With the exception of the very first student, all of the students who come after them are produced from students who have already grown up. In other words, kids who were before

weak become currently strong students. The AdaBoost approach follows the same logic as traditional boosting, albeit with a few key differences.

The AdaBoost approach employs tiny (one-level) decision trees, which are gradually introduced to the ensemble to compensate for the ensemble's poor learning ability. In the chain of models, each successive model does its best to improve upon the predictions made by the model that came before it. This is achieved by adjusting the training dataset so that more emphasis is placed on training cases in which earlier models could not correctly anticipate the outcome.

3.7 Ensemble learning

Ensemble learning refers to developing and combining a number of distinct models, which may include such things as classifiers and experts, to find a solution to a problem that involves using the intelligence of a computer. The primary goals of ensemble learning are either to improve the model performance (in terms of classification, prediction, function approximation, and so on) or to reduce the likelihood of inadvertently making a poor model selection. Both of these goals can be accomplished by combining multiple models into a single one. Both of these objectives can be achieved by combining the results of various models ensemble learning could also be used to provide such a level of confidence in a model's choice, pick up data fusion, incremental learning, nonstationary learning, and error-correcting, and it can be used to select optimal (or near ideal) features. Other ensemble learning applications include providing confidence to the model's choice, error-correcting, and incremental learning. In addition, ensemble learning can be utilised to instil confidence in the conclusion that the model has arrived at. These select features are optimal (or nearly perfect) or pick up incremental learning, nonstationary learning, as well as error-correcting. The primary purposes of ensemble learning are either to enhance the model's performance (in terms of classification, prediction, function approximation, etc.), or to lessen the likelihood of unintentionally making a poor model selection. These objectives can be achieved by combining the results of multiple models. Ensemble learning could also provide such a level of confidence in the model's choice, pick up data fusion, incremental learning, nonstationary learning, and error-correcting, and it can be used to select optimal (or near ideal) features. Other ensemble learning applications include providing confidence to the model's choice, error-correcting, and incremental learning. In addition, ensemble learning can be utilised to instil confidence in the conclusion that the model has arrived at, select optimal (or nearly perfect) features, and pick up incremental learning and nonstationary leaand rning as error-correcting. Even though this article focuses on the applications of ensemble learning that are linked to classification, the techniques that will be explained below can easily be extended to problems that involve function approximation or prediction.

The following information on several performance measures is used to determine how successful the suggested algorithm is likely to be.

3.7 Performance metrics

The process of evaluating the algorithm's performance with respect to the performance measurements of a confusion matrix uses various metrics, including accuracy, sensitivity, precision, and the F1-score, amongst others. One of the most important metrics is the F1 score.

The proportion of individuals who are correctly identified about the total number of subjects is one definition of accuracy.

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN} \quad (1)$$

Sensitivity: The percentage of appropriately positive labels recognised by our computer is referred to as recall, also known as sensitivity.

$$Sensitivity = \frac{TP}{TP + FN} \quad (2)$$

Precision: It is possible to calculate an outlook's precision by considering the total number of accurate forecasts. Predictive value is another title for this concept.

$$\Pr ecision = \frac{TP}{TP + FP} \quad (3)$$

F1-Score: The F1-score is just a statistic that considers both the accuracy and the recall of the information.

$$F1 - score = 2 * \frac{\Pr ecisison * \operatorname{Re} call}{\Pr ecision + \operatorname{Re} call} \quad (4)$$

Specificity: The system correctly assigned the specificity interpretation of the negative.

$$Specificity = \frac{TN}{TN + FP} \quad (5)$$

Where,

TP= True Positive, TN= True Negative, FP= False Positive, FN= False Negative

The following is a flow chart representation of the suggested algorithm:

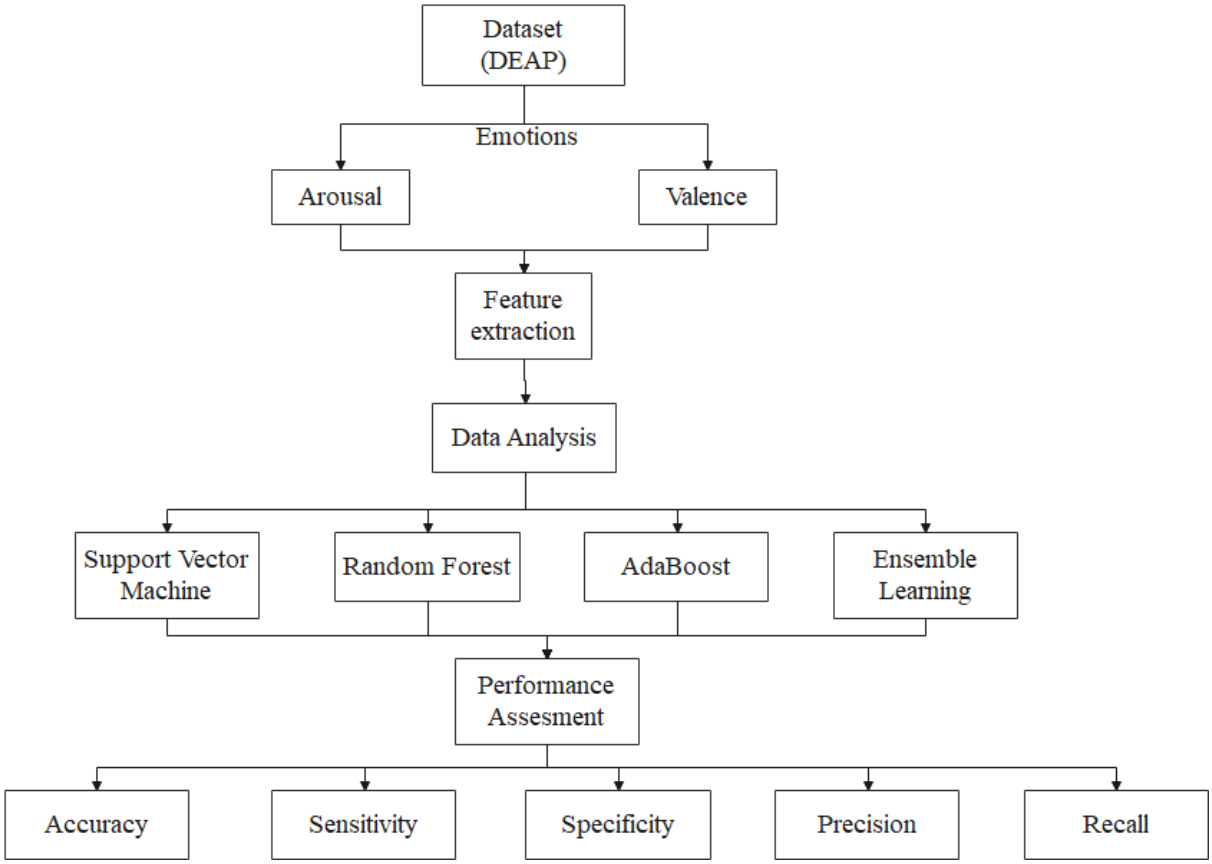

Fig 2: Algorithm Flow

IV RESULTS

The classification results on the DEAP database will be shown in the following sections under various parameters of our method.

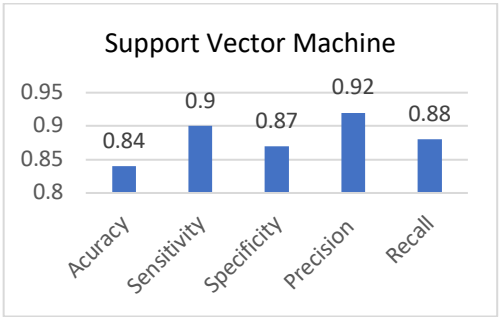

Figure 4.2: Performance parameters of SVM

The performance parameters of the support vector machine algorithm are depicted in the graphic that can be found above. The algorithm has a recall percentage of 0.88, an accuracy of 0.84, a sensitivity of 0.90, a specificity of 0.87, a precision of 0.92, and a precision.

The performance parameters of a random forest algorithm are displayed in the graphic that can be found up top. You can find it here. The algorithm has a precision of 0.89, a recall percentage of 0.93, with a sensitivity of 0.91, a specificity of 0.85, an accuracy of 0.87, and a precision of 0.89.

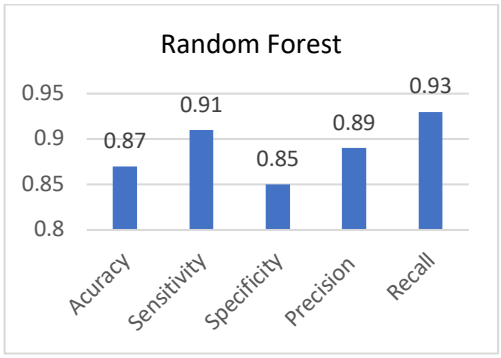

Figure 4.3: Performance parameters of Random forest

The performance parameters of a random forest algorithm are displayed in the graphic that can be found up top. You can find it here. The algorithm has a precision of 0.89, a recall percentage of 0.93, with a sensitivity of 0.91, a specificity of 0.85, an accuracy of 0.87, and a precision of 0.89.

Some performance parameters of a support vector machine algorithm are depicted in the graphic that can be found above. The algorithm has a recall percentage of 0.90, an accuracy of 0.91, a sensitivity of 0.84, a specificity of 0.92, a precision of 0.88, and an accuracy of 0.88.

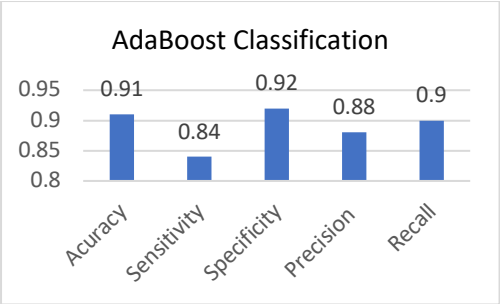

Figure 4.4: Performance parameters of AdaBoost Classification

This figure which can be found down, illustrates how the suggested ensemble learning approach performs about its various performance characteristics. The recall is at 0.96 per cent, accuracy is at 0.96, sensitivity is at 0.92, specificity is at 0.86, precision is at 0.94, and accuracy is at 0.94.

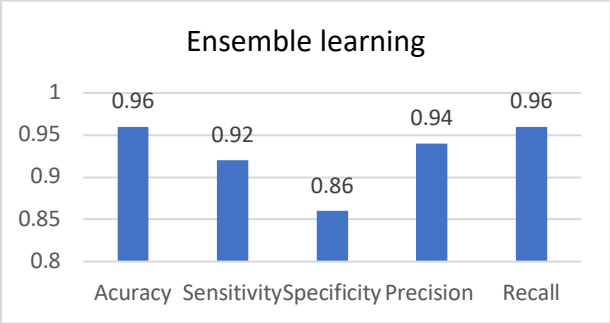

Figure 5.4: Performance parameters of Ensemble learning

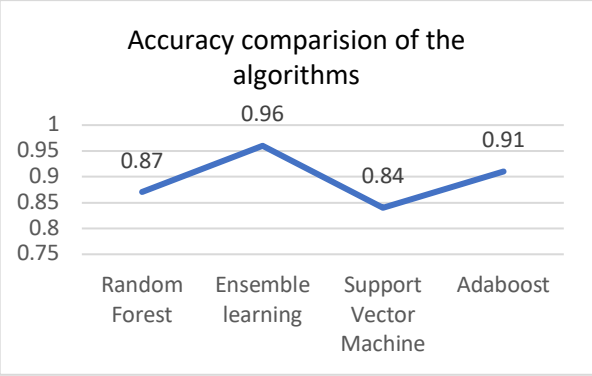

Figure 4.5: Accuracy comparison of the algorithms

The above line graph depicts the comparison of accuracy for the algorithms. It is observable that the proposed algorithm ensemble learning has high accuracy when compared with other algorithms. The accuracy of ensemble learning is 0.96, i.e., 96%. The second highest accuracy is the AdaBoost algorithm, which is 91% and less than 5% compared with the proposed algorithm. Random forest and SVM are with the proposed algorithm with 0.87 and 0.84, less than 9% and 12%, respectively.

V CONCLUSION

This work obtained different characteristics from EEG recordings, and machine learning approaches such as Ensemble learning were utilised to assess emotion levels (Arousal and Valence). According to the findings of the experiments, the suggested method effectively detects emotional information from EEG data. The most significant outcomes come from combining features. The proposed model is evaluated against several distinct algorithms presently being applied in the field to prove that it is successful. These algorithms include Random Forest, SVM, and AdaBoost. The comparison looks at accuracy, sensitivity, specificity, & recall. According to the findings, the suggested strategy has an accuracy of 96 per cent, indicating that it is pretty compelling.

In the future, features might be added to the system, and its performance might also improve. In addition, it is possible that methods of fusion based on many other qualities will be utilised in the not too distant future. Additionally, further investigation into the contribution made by each channel is possible, and there is room for improvement in channel selection.

REFERENCES

[1] O. Bazgir, Z. Mohammadi, and S. A. H. Habibi, "Emotion Recognition with Machine Learning Using EEG Signals," *2018 25th Iran. Conf. Biomed. Eng. 2018 3rd Int. Iran. Conf. Biomed. Eng. ICBME 2018*, 2018, doi: 10.1109/ICBME.2018.8703559.

[2] C. Akalya Devi, D. KarthikaRenuka, and S. Soundarya, "A survey based on human emotion identification using machine learning and deep learning," *J. Comput. Theor. Nanosci.*, vol. 15, no. 5, pp. 1662–1665, 2018, doi: 10.1166/jctn.2018.7358.

[3] M. Alex, U. Tariq, F. Al-Shargie, H. S. Mir, and H. Al Nashash, "Discrimination of genuine and acted emotional expressions using EEG signal and machine learning," *IEEE Access*, vol. 8, pp. 191080–191089, 2020, doi: 10.1109/ACCESS.2020.3032380.

[4] R. Alhalaseh and S. Alasasfeh, "Machine-learning-based emotion recognition system using EEG signals," *Computers*, vol. 9, no. 4, pp. 1–15, 2020, doi: 10.3390/computers9040095.

[5] N. V. Kimmatkar and B. Vijaya Babu, "Novel approach for emotion detection and stabilizing mental state by using machine learning techniques," *Computers*, vol. 10, no. 3, 2021, doi: 10.3390/computers10030037.

[6] E. P. Torres, E. A. Torres, M. Hernández-Álvarez, and S. G. Yoo, "Emotion Recognition Related to Stock Trading Using Machine Learning Algorithms with Feature Selection," *IEEE Access*, vol. 8, pp. 199719–199732, 2020, doi: 10.1109/ACCESS.2020.3035539.

[7] L. A. Martínez-Tejada, Y. Maruyama, N. Yoshimura, and Y. Koike, "Analysis of Personality and EEG Features in Emotion Recognition Using Machine Learning Techniques to Classify Arousal and Valence Labels," *Mach. Learn. Knowl. Extr.*, vol. 2, no. 2, pp.

99–124, 2020, doi: 10.3390/make2020007.

[8] I. N. Yulita, R. R. Julviar, A. Triwahyuni, and T. Widiastuti, "Multichannel Electroencephalography-based Emotion Recognition Using Machine Learning," *J. Phys. Conf. Ser.*, vol. 1230, no. 1, 2019, doi: 10.1088/1742-6596/1230/1/012008.

[9] R. K. Jeevan, S. P. Venu Madhava Rao, S. K. Pothunoori, and M. Srivikas, "EEG-based emotion recognition using LSTM-RNN machine learning algorithm," *Proc. 1st Int. Conf. Innov. Inf. Commun. Technol. ICIICT 2019*, pp. 1–4, 2019, doi: 10.1109/ICIICT1.2019.8741506.

[10] C. Qing, R. Qiao, X. Xu, and Y. Cheng, "Interpretable Emotion Recognition Using EEG Signals," *IEEE Access*, vol. 7, pp. 94160–94170, 2019, doi: 10.1109/ACCESS.2019.2928691.

[11] V. Doma and M. Pirouz, "A comparative analysis of machine learning methods for emotion recognition using EEG and peripheral physiological signals," *J. Big Data*, vol. 7, no. 1, 2020, doi: 10.1186/s40537-020-00289-7.

[12] N. Yousefian, J. H. L. Hansen, and P. C. Loizou, "A hybrid coherence model for noise reduction in reverberant environments," *IEEE Signal Process. Lett.*, vol. 22, no. 3, pp. 274–277, 2015, doi: 10.1109/LSP.2014.2352352.

[13] C. Wei, L. lan Chen, Z. zhen Song, X. guang Lou, and D. dong Li, "EEG-based emotion recognition using simple recurrent units network and ensemble learning," *Biomed. Signal Process. Control*, vol. 58, p. 101756, 2020, doi: 10.1016/j.bspc.2019.101756.

[14] E. S. Pane, A. D. Wibawa, and M. H. Purnomo, "Improving the accuracy of EEG emotion recognition by combining valence lateralization and ensemble learning with tuning parameters," *Cogn. Process.*, vol. 20, no. 4, pp. 405–417, 2019, doi: 10.1007/s10339-019-00924-z.

[15] J. Zhang, Z. Yin, P. Chen, and S. Nichele, "Emotion recognition using multi-modal data and machine learning techniques: A tutorial and review," *Inf. Fusion*, vol. 59, no. March 2019, pp. 103–126, 2020, doi: 10.1016/j.inffus.2020.01.011.

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FIRE & GAS DETECTION ROBOT FOR AUTOMATIC POWER STATION

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ABSTRACT:

Fire Detectors play a very important role in Industries, Shops, Malls, Residential complexes, parking areas, etc. They help in detecting fire or smoke at an early stage and can help in saving lives. Commercial Fire detecting systems usually have an alarm signaling, with the help of a buzzer or Siren. We have designed an IOT based Fire Alerting System using Temperature and a smoke sensor which would not only signal the presence of fire in a particular premise but will also send related information through IOT. Internet of Things (IoT) is basically the network of 'things' by which physical things can exchange data with the help of sensors, electronics, software, and connectivity. These systems do not require any human interaction. In this Arduino fire alarm system using temperature and smoke sensor using the IOT project, we can send LIVE information like Temperature, Smoke Value detected by a particular device to the Fire Department. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Full wave bridge rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

Keywords: IOT platform, Wifi, ESP8266, Gas sensor, fire sensor .

1. INTRODUCTION:

FIRE AND GAS is that the abbreviation or short kind for liquefied oil gas. Like all fossil fuels, it's a non-renewable supply of energy. It is extracted from fossil oil and gas. The most compositions of FIRE AND GAS square measure Hydrocarbons containing three or four carbon atoms. The conventional parts of FIRE AND GAS so, square measure gas (ClHa) and alkane (CaHro). Tiny concentrations of alternative hydrocarbons may additionally be gift betting on the supply of the FIRE AND GAS and the way it's been created, parts apart from hydrocarbons may additionally be gift. FIRE AND GAS is extremely combustible and should thus be hold on off from sources of ignition and during a well-ventilated space, in order that any run will disperse safely. FIRE AND GAS vapors is heavier than air thus care ought to be taken throughout storage in order that any run won't sink to the bottom and find accumulated in a district that is low lying and tough to disperse. FIRE AND GAS gas is largely gas and alkane and it's scentless in its state of nature. The smell that we tend to notice once there's a run is really of a wholly totally different agent, referred to as alkyl radical Mercaptan. This substance is

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additional to the gas once it leaves the most storage terminals [1]. The prime aim of paper is to detect Gas leakage in home, hotels, schools and other domestic areas, and gives alert message to the surrounding people. Nowadays Gas sensors are being used globally in the field like safety, health, instrumentation etc. This paper is an implementation of the same using MQ-5 gas sensor and DHT11 temperature sensor. The MQ5 sensor is commonly used for detecting gas leakage for various applications and the DHTIL is used for measuring the humidity and temperature of surrounding area. The device also keeps displaying the leakage amount and humidity & temperature on an LCD display. The MQ6 gas sensor detects the concentration of gas in ppm and outputs analog value which can be converted to a digital signal using inbuilt Analog to Digital Convertor of Arduino. The paper allows the user to set the low, medium and dangerous level for leakage based on the same digital measure. The intensity values are compared with two predetermined thresholds and based on that, it classifies it into three different classes of concentration of leakage [2].

OVER VIEW:

There are about 89% householder's uses FIRE AND GAS cylinders in India. The Several requirements have been carried out for the fuel leakage detection system. The current structures offers an alarm machine which is on the whole supposed to discover an Gas leakage in the house and industrial premises The goal of the proposed machine is to always measure the weight of the cylinder and as quickly as it reaches the minimal threshold it will routinely sends an SMS alert to the consumer as nicely as Authorized FIRE AND GAS agent so that they can act accordingly. This machine additionally designed to realize FIRE AND GAS gases such as propane and butane. The allowed degree for butane is 600ppm above which it is regarded to be of excessive degree and poses a danger. The threshold stage of weight of the cylinder is used for automated cylinder booking. The foremost intention of this venture is to screen for liquid petroleum gasoline (FIRE AND GAS) leakage to keep away from primary hearth accidents and additionally facilitating protection precautions the place protection has been an essential trouble and automated cylinder reserving except human intervention. The gadget detects the leakage of the FIRE AND GAS the usage of gasoline sensor and signals the customer about the fuel leakage by way of sending SMS. The gadget measure the weight of cylinder by using the use of weight sensor and show corresponding weight in FIRE AND GAS display. The proposed gadget makes use of the GSM Modem to alert the man or woman about the gasoline leakage by way of SMS and repute of automated cylinder booking. When the machine identifies that FIRE AND GAS attention in the air reaches the designated degree then it alert the purchaser via sending SMS to registered cellular Smartphone and alert the humans at domestic via activating the alarm which consists of Buzzer concurrently and additionally show the identical message on

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LCD to take the fundamental motion and change on the exhaust fan or opening home windows to limit the fuel attention in the air.

2. LITERATURE SURVEY:

In the year 2011, A. MAHALINGAM, R. T. NAAYAGI,1, N. E. MASTORAKIS, "Design and Implementation of an Economic Gas Leakage Detector", This project developed system to detect the gas leakage and providing immediate alarm or intimation to the user. Later in 2013, few people developed the design proposed for home safety. This system detects the leakage of the FIRE AND GAS and alerts the consumer about the leak by buzzer.

This project was developed using microcontroller ARM version 7 processor and simulated using Keil software. In the year 2014, Hitendra Rawat, Ashish Kushwah, Khyati Asthana, Akanksha Shivhare, designed a system, They provided security issues against thieves, leakage and fire accidents. In those cases their system sends SMS to the emergency number provided to it. In the proposed system we have designed "FIRE AND GAS gas monitoring and automatic cylinder booking with alert system". These report focus on detection of economic fuels like petroleum, liquid petroleum gas, alcohol..etc., and alert the surrounding people about the leakage through SMS. It also sense surrounding temperature, so that no fire accidents occurs. The one more important feature is automatic cylinder booking by noticing the current expenditure of FIRE AND GAS gas in our daily life. These projects alert the user by sending message to mobile through SMS in three conditions. They are

When FIRE AND GAS gas weight reaches to maximum threshold value.

When the FIRE AND GAS gas exceed its peak value.

When the temperature exceed more than room temperature.

These project gives alert message by buzzing the buzzer and trough SMS to the house holders. We also provide automatic doors and windows opening, so that the compressed gas can spread in to air freely. Hence a fire accident does not occur.

In the slide share document (2014); They introduce a golem and mobile application for the in the meantime, the system image has impressively incontestable its use and capability in intensive series of tests. The drive unit, the navigation system and, therefore, the complementary detector systems performed fantastically throughout the tests. Moreover, it helps to avoid practice of human inspectors in in all probability dangerous environments. However, before activity in industrial settings, a lot of development is required (e.g., in explosion protection, package development, etc.), and if truth be told legal issues ought to be processed before activity in business settings. Still, it's sure that AN autonomous, mobile gas detection and leak localization golem is feasible these days and might considerably enhance safety [4].

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Pal-Stefan et.al (2008); Introduced few old and new technologies to detect the gas. In this the proposed techniques are nontechnical, acoustic methods, optical methods and active methods. Survey says wide range of techniques are available for Gas detection. However, each applications has few of the limitations [5]

Manichandana Simrah et.al (2019); in this paper they told about their research on leakage detection and analysis of leakage point in the gas pipeline system. In this paper they gave various model which used SCADA I/F Model: The SCADA system has the function of transferring the acquired data from a pipeline system to Transient Simulation Model every 30 seconds. This module communicates with SCADA. Dynamic parameters are collected every 30 seconds, such as pressure, flow and temperature. Transient Simulation Model: Transient flow is simulated utilizing perfect numerical methods based on actual data. Pressure and temperature served as independent variables are provided in order to get average pressure and average temperature [6].

3. PROPOSED SYSTEM:

FIRE AND GAS and fire Detectors play a very important role in Industries, Residential complexes, parking areas, etc. They help in detecting fire or smoke at an early stage and can help in saving lives. Commercial FIRE AND GAS and fire detecting systems usually have an alarm signaling, with the help of a buzzer or Siren. We have designed an IOT based Fire Alerting System using Temperature and a smoke sensor which would not only signal the presence of fire in a particular premise but will also send related information through IOT. Internet of Things (IoT) is the networking of 'things' by which physical things can communicate with the help of sensors, electronics, software, and connectivity. These systems do not require any human interaction and same is the case with iot based gas detection system, it does not require human attention.

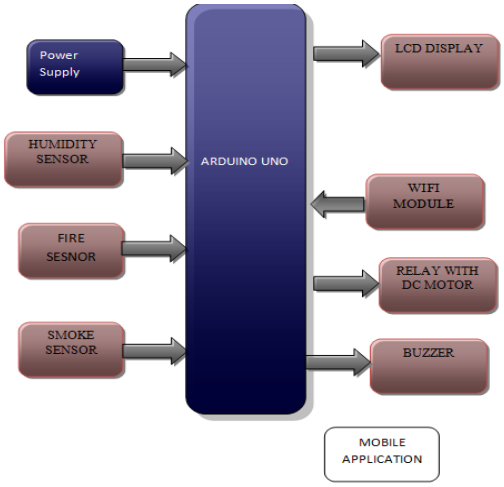

Fig.3.1. Hardware block diagram.

4. RESULTS EXPLANATION

IOT and Arduino based FIRE AND GAS leakage detection system senses the FIRE AND GAS gas with the help of an FIRE AND GAS gas sensor. FIRE AND GAS gas sensor interfacing with Arduino is implemented in this project. The Signal from this sensor is sent to the Arduino microcontroller. The microcontroller is connected to an LCD, Buzzer and IOT module (ESP8266). IOT FIRE AND GAS leakage detector project is implemented

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using an ESP8266 chip. This is a WiFi module which is used for connecting microcontrollers to Wi-Fi network and makes TCP/IP connections and sends data. Data, which is sensed by these sensors, is then sent to the IOT. The IOT module then sends the data over to a website. Once the gas leakage is detected, the buzzer is turned ON and a 'Leakage detected' message is displayed on the LCD. The Pre-requisite for this FIRE AND GAS gas leakage detection and the smart alerting project is that the Wi-Fi module should be connected to a Wi-Fi zone or a hotspot. This project is also implemented without the IOT module. . In place of the IOT module, we have used a WIFI module, by which an SMS is triggered.

OPERATION:

We have used various components in the IOT and Arduino based FIRE AND GAS leakage detection system. FIRE AND GAS Gas Sensor is used to detect the gas leakage. Arduino is used to turning ON the buzzer, to send a message to LCD and to send data to the IOT module. LCD is used to display an informative message. A buzzer is used to signal the gas leakage. And ESP8266 is used to send data over a Wi-Fi network.

Fig.4.1. Hardware kit.

5. CONCLUSION:

Fire safety measures and equipment in the workplace must be kept in effective working order. This includes all fixtures and fittings such as fire doors, staircases, corridors, fire detection and alarm systems, fire-fighting equipment, notices and emergency lighting. Regular checks, periodic servicing and maintenance must be carried out, whatever the size of the workplace. Any defects should be put right as quickly as possible. An employer or nominated employee can carry out checks and routine maintenance work. However, it is important to ensure the reliability and safe operation of fire-fighting equipment and installed systems such as fire alarms and emergency lighting. This is best done by using a competent person to carry out periodic servicing and any necessary repairs. A record of the work carried out on such equipment and systems will help to demonstrate compliance with the law.

REFERENCES:

[1] Stipanicev D., Vuko T., Krstinic D., Stula M., Bodrozic L., " Forest Fire Protection by Advanced Video Detection SystemCroatian Experiences", Split, Croatia, 2006

[2] Losso A., Corgnati L., Perona G., " Early Forest Fire Detection: Smoke Identification through innovative Image Processing using Commercial Sensors", Environment Including Global Change, Palermo, Italy, 2009

[3] Kovacs R., Kiss B., Nagy A., Vamos R., "Early Forest Fire Detection System For Vegetable Fire in the Aggtelek National Park", Budpest, Hungary,2004

[4] Kelha V., Rauste Y., Buongiorno A., "Forest Fire Detection by Satellites for Fire Control", European Space Agency, Finland, 2000

[5] Manyangadze T., "Forest Fire Detection for Near Real Time Monitoring using Geostationary Satellite", International Institute for Geo-information Science and Earth Observation, Enschede, Netherland, 2009

[6] Son B., Her Y., Kim J., "A Design and Implementation of Forest Fire Surveillance System based on Wireless Sensor Network for South Korea", International Journal of Computer Science and Network Security, Vol 6 No. 9B, September 2006

[7] Hariyawan M.Y., Gunawan A., Putra E.H., "Wireless Sensor Network for Forest Fire Detection", ISSN:1693-6930,Vol. 11, No. 3, pp. 563~574, September 2013 [8] P.J Vivek , G. Raju , S. Akarsh, "Forest Fire Detection System", International Journal of Innovative Research in Science, Engineering and Technology, ISSN: 2319-8753, Vol 3, Issue 6, June 2014

[9] Tao H., Zhang H., "Forest Monitoring Application Systems Based on Wireless Sensor Networks", Third International Symposium on Intelligent Information Technology Application Workshops, IEEE, 2009

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DESIGN OF SMART HELMET FOR ACCIDENT AVOIDANCE

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ABSTRACT:

The main aim of the system is to develop a smart helmet for the bikers to provide safety and security. People prefer motorcycles over car as it is much cheaper to run, easier to repair, easier to park and flexible in traffic. The rate at which number of two wheelers in India is rising is 20 times the rate at which human population is growing. In such scenario fatalities are only going to rise if things do not change fast. The risk of death is 2.5 times more among riders not wearing a helmet compared with those wearing a helmet. In order to provide safety while driving two wheelers this is being developed.

Keywords: GSM, GPS, Switch, Buzzer.

1. INTRODUCTION:

Two wheelers are widely used than other form of vehicles due to its low cost and simplicity. Most of the time rider doesn't like to wear Helmet which could result in fatal accidents. Drink and drive and rash riding are the major factors for such road accidents. Some statics shows that two wheelers cause 25% of the accidents and in that 60% of the two wheeler accidents are caused due to rash riding, drunken driving and not wearing helmet. The primary concern of all riders is safety. Nowadays, statistics says that the annual average road accident is estimated to be about 7, 00,000 of which 10% occur in India which has overtaken China. The report of a year revealed by the World Health organization (WHO) in its Global status report on road safety says that around 80,000 people are killed on Indian roads due to rash driving and less usage of helmets. Also, almost all the countries are forcing the motor riders to wear the helmet and not to use the bike when the user is riding without helmet. The system implemented by us aims at reducing the road accidents in the near future due to drunken driving. This system detects the presence of alcohol in the vehicle and immediately locks the engine of vehicle. At the same time an SMS along with the location of vehicle is send to three pre-selected contacts. Hence the system reduces the quantum of road accidents and fatalities due to drunk driving in future. This paper implemented the system on GPS for recognizing the location of vehicle of accident detection and sensors for safety measure and to know the road condition and reason for accidents. The helmet can attach to Zigbee, so that it can communicate the system.

This project aims to provide safety for bike riders. Even since helmets have been made compulsory, still people drive without helmets. Comparatively, in the last few years, there has been a rapid hike in the number of road accidents. According to vehicle safety, India meets only two out of the sevenvehicle safety standards by the World Health Organization (WHO). Two-

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wheelers account for 27% of total road crash deaths. Nearly 73% of motorcycle riders involved in accidents continued to wear helmets as shown in the records. Section 129 of the Motor Vehicles Act, 1988 makes it required for every single riding a two-wheeler to wear protective headgear following to standards of the BIS (Bureau of Indian Standards). In India, a drunk drive case is a criminal offense of The Motor Vehicle act 1939, which implies the bike rider will get punished. In existence bike riders easily get escaped from the law. These are the three main issues that motivate us for developing this project. The first step is to check whether the helmet is worn or not. If the helmet is worn then ignition will start otherwise it will remain off till the helmet is not worn. For these, we use a touch sensor. The second step is alcohol detection. The alcohol sensor is used as a breath analyzer which checks the presence of ethanol in rider breath and if it crosses permissible range ignition cannot start. It will send the message to the registration number. MQ3 sensor is used for these. When these two conditions are satisfied then only the bike ignition will start. The third main issue is accident detection. If the rider met an accident with him he cannot receive medical help instantly, it's a big reason for deaths. There are a lot of deaths due to late medical help or the accident place is unmanned. In the rider falls for that detection, we place MPU6050 at the bike unit. Due to this mechanism, we detect the accident occurs or not. The aim of this project is to make a protection system in a helmet for the good safety of bike rider In the helmet unit, the sensor module is built using sensors like alcohol sensors, accelerometer sensors, and touch sensors. All the above sensors are connected to Arduino Uno and RF transmitter. Once the person wears the helmet the signals get transmitted. The unit in the bike allows the rider to start the vehicle once it receives the signals from the helmet unit. The status of the helmet worn is uploaded to the database via the ESP8266 module. All events are uploaded to the database and from the database, it is retrieved in the android application.

2. LITERATURE SURVEY

Smart Helmet with Sensors for Accident Prevention[1] The impact when a motorcyclist involves in a high speed accident without wearing a helmet is very dangerous and can cause fatality. Wearing a helmet can reduce shock from the impact and may save a life. There are many countries enforcing a regulation that requires the motorcycle's rider to wear a helmet when riding on their motorcycle, Malaysia is an example. With this reason, this project is specially developed as to improve the safety of the motorcycle's rider. Motorcyclist will be alarmed when the speed limit is exceeded. A Force Sensing Resistor (FSR) and BLDC Fan are used for detection of the rider's head and detection of motorcycle's speed respectively. A 315 MHz Radio Frequency Module as wireless link which able to communicate between transmitter circuit and receiver circuit. PIC16F84a is a microcontroller to control the entire component in the system. Only when the rider buckled the helmet then only the motorcycle's engine will start. A LED will flash if the motor speed exceeds 100 km/hour. Keywords-Microcontroller PIC16F844a, 315 MHz Radio Frequency Module, Force Sensing Resistance, BLDC Fan, 5VRelay, LM311 and IC 555.

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Smart Helmets for Automatic Control of Headlamps [2] Intelligent Safety Helmet for Motorcyclist is a project undertaken to increase the rate of road safety among motorcyclists. There are many countries enforcing regulations to wear a helmet while riding. India is an example. The idea is obtained after knowing that the increasing number of fatal road accidents over the years is cause for concern among motorcyclists. This project is designed to introduce automatic autonomous headlight technology for the safety of motorcyclist. Here, we focus on intelligent headlamps that react according to the rider's facial movement. It makes use of accelerometer and other sensors to direct small electric motors built into the headlight casing to turn the headlights accordingly. Keywords- Smart helmets, Headlamps, Accelerometer, RF transmitter, RF receiver, Servo motor

A Smart Safety Helmet using IMU and EEG sensors for worker fatigue detection[3] It is known that head gesture and brain activity can reflect some human behaviors related to a risk of accident when using machinetools. The research presented in this paper aims at reducing the risk of injury and thus increase worker safety. Instead of using camera, this paper presents a Smart Safety Helmet (SSH) in order to track the head gestures and the brain activity of the worker to recognize anomalous behavior. Information extracted from SSH is used for computing risk of an accident (a safety level) for preventing and reducing injuries or accidents. The SSH system is an inexpensive, non-intrusive, noninvasive, and non-vision based system, which consists of an Inertial Measurement Unit (IMU) and dry EEG electrodes. Adaptec device, such as vibrotactile motor, is integrated to the helmet in order to alert the operator when computed risk level reaches a threshold. Once the risk level of accident breaks the threshold, a signal will be sent wirelessly to stop the relevant machine tool or process. Key words — Safety; Head motion recognition; IMU; EEG; accident avoidance; human machine interaction

Helmet-Mounted Smart Array Antenna [4] Introduction With the advent of wireless telecommunications, efforts to develop personnel-carried personal communications equipment are being very vigorously pursued. For the personal antenna needed in this application, the area around the skull is a prime location and the future of a head-mount antenna has been envisioned. For fire fighters, forest rangers, border patrols, and military personnel, the helmet provides a natural platform on which a head-mount antenna can be realized. However, the continually varying skeletal position associated with the movements of the individual, as well as propagation interferences including multipath fading and man-made interferences, makes it desirable to design a "smart" antenna with pattern-diversity to compensate for these problems. In this paper, we present a preliminary design, with measured data, for a smart helmet-mounted antenna that has these performance features.

Low-Power Low-Profile Multifunction Helmet-Mounted Smart Array Antenna[5] The development of a smart lowprofile helmet-mounted antenna with pattern diversity has been previously reported by the authors. This smart antenna array virtually ensures stable reception despite problems such as the continually varying skeletal position associated with the movements

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of the individual, as well as propagation interferences, even for locations which are "dead spots" for conventional antennas However, with the extremely limited space and battery power available, on the helmet, it is necessary that the antenna be multifunction and the power consumption be minimal. In this paper, we present a design for an advanced smart helmet-mounted antenna which employs low-power CMOS control devices and innovative antenna technology for reduction (patents pending). This smart array uses pattern diversity to mitigate the effects of multipath fading and the soldier changing skeletal orientation. In the past, smart antenna techniques have generally been applied to base-station antennas only. By taking advantage of a unique low-cost, low-power, pattern diversity switching mechanism, as well as the recent rapid decline in component and device costs and size, we believe we have made one of the first practical portable smart antenna systems.

3. METHODOLOGY

The flowchart describes the functionality of the "Accident Detection, Theft detection and drive protection using intelligent wireless safety helmet". The helmet unit conditionally checks "Helmet Wearing" and "Alcohol Sensing". If condition is met then helmet unit sends affirmative signal to bike unit through RF communication [8] .There after the vehicle start moving. When accident take place then GSM module sends location using GPS to saved contact list.

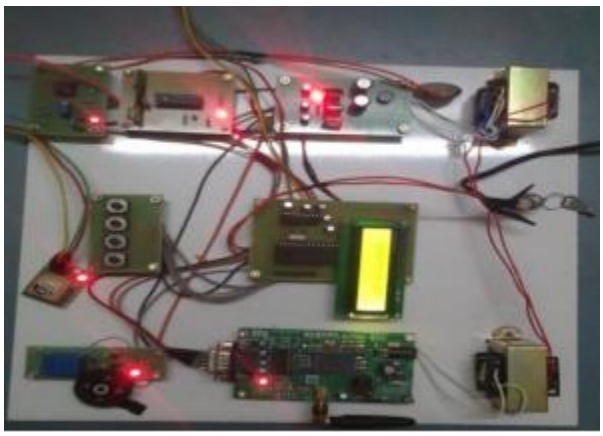
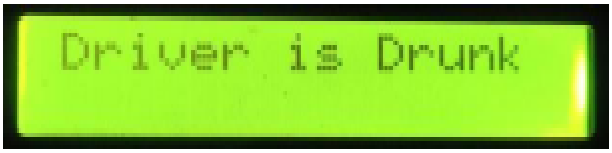


Fig.1. Hardware kit

Illegal consumption of alcohol during driving is 0.08 mg/L as per the government act but for demonstration purpose, it is programmed to the threshold limit 0.04 mg/L .threshold can be adjusted using potentiometer. If sensitivity of MQ-3 is more 0.04 mg/L of alcohol in breath then the helmet unit will communicate with vehicle unit and show" Driver is drunken" thereafter the ignition system get switched off as shown in figure.

Arrange of frequency generated depending upon the vibration produced due to accident or obstacle .if the frequency is greater than the threshold value then vehicle unit shows "Bike has fallen "as shown in figure.



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CONCLUSION

The developed system efficiently ensures. Rider is wearing helmet throughout the rider. Rider should not be under influence of alcohol, Accident detection &theft protection. By implementing this system a safe two wheeler journey is possible which would decrease the head injuries during accidents and also reduce the accident rate due to driving bike after consuming alcohol. A helmet is not be 100% foolproof but it definitely the first line of defence for the rider in case of an accident to prevent fatal brain injuries. The proposed approach makes it mandatory for the ruder to use this protective guard in order to drive a two wheeler vehicle and ensures the safety of human brain and therefore reduces the risk of brain injuries and deaths in case of an accidents. Besides the developed system prevents the theft of two wheeler.

Future Scope:

The developed system efficiently ensures that the rider is wearing helmet through out the ride. Rider will not be under the influence of alcohol while riding. Accident location can be detected, which is helpful to provide immediate medical help. Vehicle theft can be detected and by sending lock message the ignition can be turned off. In this project belt tie sensor is used instead pressure sensors can be used to detect if the helmet is worn, IR sensors and temperature sensors can also be used for a better detection. we can make use of small camera for the recording the drivers activity. If there is a large demand of this type of helmets we can manufacture whole circuit in printed circuit board, so that circuit becomes smaller and can be easily fitted into helmet. In this project RF transmitter and receiver are used to provide a proper communication. In future we can enhance our project through placing high efficiency RF transmitter.

REFERANCES

1. Amitava das and SoumitraGoswami [2015],"Design And Implementation of Intelligent Helmet to Prevent Bike Accident In India".

2. E.D.Dekiaris, A.Spadoni and S.I.Nikolaou,May 2009,"New safety and comfort in powered two wheelers".

3. Harish Chandra Mohandas, Raja Kumar Mahapatra and Jyotirmayee Module (2014)", Anti-Theft Mechanism System with Accidental Avoidance and Cabin Safety System for Automobiles", International Refereed Journal of Engineering and Science (IRJES), Vol. 3, No. 4.

4. M.Pieve,F.Tesauri and A.Spadoni,May 2009,"Mitigation accident risk in powered two wheelers:Improving effectiveness of human machine interface collision avoidance system in two wheelers"

5. Orace, V.S.Reinhardt and S.A Vanghn, "Integrated disease Surveillance Project –Project Implementation plan", 2004.

6. Ping Li, RamyMeziane, Martin J.-D. Otis, Hassan Ezzaidi, September 2015" A Smart Safety Helmet using IMU and EEG sensors for worker fatigue detection" REPARTI Center, University of Quebec at Chicoutimi Chicoutimi, Canada Email: Martin_Otis@uqac.ca Philippe Cardou REPARTI Center, Laval University Quebec, Canada

7. Prof.PratikshaBhuta,KaranDesai,ArchitaKeni, “Alcohol Detection and vehicle controlling",International journal of Engineering Trends and application, 2015.

8. Prof.Sudarsan .K and Kumaraguru . P (2014), “Helmet for Road Hazard Warning with Wireless Bike Authentication and Traffic Adaptive Mp3 Playback”, International Journal of Science and Research (IJSR), Vol. 3, No. 3, ISSN.

9. Prof.Sudarshanraju,Manjesh, January 2015 ”Two Wheelers By Smart Helmet And Four Wheelers by Vehicular Communication”, International Journal Of Engineering Research, Hindupur.

10. Vijay J, Saritha B, PriyadharshiniB, Deepeka S and Laxmi R (2011), “Drunken Drive Protection System”, International Journal of Scientific & Engineering Research, Vol. 2, No. 12, ISSN: 2229-5518.

AN ANALYTICAL RESEARCH BASED ON THE SUM OF POSITIVE DIVISORS FUNCTIONS

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Abstract- Properties of divisor functions σk (n), defined as sums of k-th powers of all divisors of n, are studied through the analysis of Ramanujan's differential equations. This system of three differential equations is singular at $x = 0$. Solution techniques suitable to tackle this singularity are developed and the problem is transformed into an analysis of a dynamical system. Number theoretical consequences of the presented dynamical system analysis are then discussed, including recursive formulas for divisor functions.

Keywords: Eisenstein series, Ramanujan differential equations, Singular equations.

1 INTRODUCTION

In 1916, Ramanujan [8] showed that certain arithmetic functions satisfy a system of three singular differential equations. Denoting the scaled Eisenstein series by

$$U_\ell(x) = c_\ell \sum_{n=1}^{\infty} \sigma_{2\ell-1}(n) x^n,$$

where

$\ell \in \mathbb{N}, |x| < 1, \sigma_k(n) = \sum_{d|n} d^k$ and c_ℓ

is a scaling constant, Ramanujan formulated his differential equations in terms of three dependent variables

$$P = 1 - U_1, \quad Q = 1 + U_2, \quad R = 1 - U_3$$

with the choice of scaling constants $c1 = 24$, $c2 = 240$, $c3 = 504$ as the following system

$$x\frac{dP}{dx} = \frac{P^2 - Q}{12},$$
$$x\frac{dQ}{dx} = \frac{PQ - R}{3},$$
$$x\frac{dR}{dx} = \frac{PR - Q^2}{2}.$$

System (1.4)may be derived alternatively through a triple product identity and a quintuple product identity [3], and that approach was later extended to derive similar differential equations for Eisenstein series of level 2 [10]. Ramanujan's differential equations were previously mapped into a first order Riccati differential equation by [5,6], with the solutions expressed in terms of hypergeometric functions after a sequence of transformations. Along these lines, Zudilin [12] provides further connections between

Eisenstein series and hypergeometric functions. A similar method for cubic theta functions was given by Huber [7]. In the present paperwe take a different approach, utilising a series development about the singular point $x = 0$. One benefit of the presented approach is that we are able to extract information about the Eisenstein series and divisor functions through recursive calculation of the series coefficients.

The paper is organized as follows. In Sect. 2, we rewrite Ramanujan's system in terms of variables $U1$, $U2$, and $U3$ and derive recursive relation for their solutions. It is natural to wonder if there are other solution branches, and in Sect. 3, we transform this singular system of differential equations to a regular system by changing the independent variable from x to $t = -\log x$. The large-t behaviour of the resulting system is then investigated, with different steady sates corresponding to different initial conditions at $x = 0$ for the original system.

2 DYNAMICAL SYSTEM ANALYSIS OF RAMANUJAN'S DIFFERENTIAL EQUATIONS

Through the series development of Sect. 2 we have been able to use series in a neighbourhood of $x = 0$ in order to extract salient features of the solutions to Ramanujan's differential equations, identifying a one-parameter family of solutions. Due to the singular nature of these equations, it is not clear that the only solutions will originate with $U_(0) = 0$ for $_ = 1, 2, 3$, or if there are other solution branches which are fundamentally singular. In this section, we change the independent variable and treat Ramanujan's differential equations as a dynamical system which evolves toward a condition as $x \to 0+$.

Consider the system of differential equations and transform the independent variable x to t by using $t = -\log x$. Then the limit $x \to 0+$ corresponds to $t \to \infty$. We have

$$\frac{\mathrm{dV}}{\mathrm{d}t} = -A\,\mathbf{V} - \mathbf{b}(\mathbf{V}),$$

3 NUMBER THEORETICAL CONSEQUENCES

The evaluation of sums of the form $_\sigma(m)\sigma(n)$ has attracted interest in the literature, and we use our results to calculate certain sums of this type in terms of the coefficients of solutions to Ramanujan's differential equations. Considering $a = 1$ in Formula and comparing with, we obtain the following iterative relation between divisor functions

$$\begin{pmatrix}\sigma_1(n)\\ \sigma_3(n)\\ \sigma_5(n)\end{pmatrix} = \begin{pmatrix}1/c_1 & 0 & 0\\ 0 & 1/c_2 & 0\\ 0 & 0 & 1/c_3\end{pmatrix}(A-nI)^{-1} \times \sum_{j=1}^{n-1}\begin{pmatrix}48\,\sigma_1(j)\,\sigma_1(n-j)\\ 1920\,\sigma_1(j)\,\sigma_3(n-j)\\ 6048\,\sigma_1(j)\,\sigma_5(n-j)-28800\,\sigma_3(j)\,\sigma_3(n-j)\end{pmatrix},$$

where $c_$ is given by. This formula can be iteratively used to compute the values of $\sigma 1(n)$, $\sigma 3(n)$, and $\sigma 5(n)$. It can also be rewritten in the form of convolution identities.

4 DISCUSSION

We have employed both a series development and a dynamical systems approach to better understand solutions of Ramanujan's equations. Our results imply the existence of a one-parameter family of solutions to these equations which comprise a similarity scaling of the scaled Eisenstein series, in addition to another class of solutions which is not zero at $x = 0$. This latter class of solutions can, however, be brought into the form of the scaled Eisenstein series through a shift of the dependent variable and a scaling of the independent variable. This suggests that the vital information encoded in these series through their coefficients is invariant under Ramanujan's differential equations, modulo shifting and scaling, and that the value of specific divisor functions remains encapsulated in these series solutions. In addition to their intrinsic interest, Ramanujan's differential equations give information about certain Eisenstein series, and we demonstrate that our results give an alternate approach to obtain formulae involving sums of products of divisor functions.

The results we obtain can be used to better understand solutions of related differential equations of relevance to the Eisenstein series. In addition to the Eisenstein series which satisfy Ramanujan's differential equations, we remark that solutions of various second-order differential equations with coefficients involving the Eisenstein series have also attracted some attention [9]. Treating the Eisenstein series in the manner of, one can then solve such second-order differential equations with a series, making use of the Cauchy product of the series for the unknown function with our series representation for the Eisenstein series.

The algebraic independence of the functions P, Q, R in (1.2) and hence of $U1$, $U2$, $U3$ in was discussed in [11]. It is worth noting that additional relations

exist between U_l for $l \geq 4$, with the first several of these shown. One can then express U_l for $l \geq 4$ in terms of algebraic combinations of the $U1$, $U2$, and $U3$ variables. As an example, from entry 4 we have that $1+480U4 = Q2 = (1 + U2)2$. Defining $S = Q2$, we see that

$$x\frac{dS}{dx} = 2xQ\frac{dQ}{dx} = \frac{2}{3}(PQ^2 - QR) = \frac{2}{3}(PS - QR).$$

Rewriting this as an equation involving $U4$ by taking $c4 = 480$, one obtains a fourth-order analogue of the third-order system (2.1). Continuing in this manner, one may obtain higher-order analogues of system involving $U1$, $U2$, UN for $N \geq 4$, and using the approach we outline for, onemay obtain the series coefficients recursively in a similar manner, providing alternate derivations for formulae analogous.

REFERENCES

1. Alaca, S., Williams, K.: Evaluation of the convolution sums $l + 6m = no(l)o(m)$ and $_2l+3m=no(l)o(m)$. J. Number Theory **124**(2), 491–510 (2007)
2. Aygin, Z.,Hong, N.: Ramanujan's convolution sum twisted by Dirichlet characters. Int. J. Number Theory **15**(1), 137–152 (2019)
3. Chan, H.: Triple product identity, quintuple product identity and Ramanujan's differential equations for the classical Eisenstein series. Proc. Am. Math. Soc. **135**(7), 1987–1992 (2007)
4. Coddington, E., Levinson, N.: Theory of Ordinary Differential Equations. McGraw-Hill Book Company, Inc., New York (1955)
5. Hill, J., Berndt, B., Huber, T.: Solving Ramanujan's differential equations for Eisenstein series via a first order Riccati equation. Acta Arith. **128**(3), 281–294 (2007)
6. Huber, T.: Basic representations for Eisenstein series from their differential equations. J. Math. Anal. Appl. **350**(1), 135–146 (2009)
7. Huber, T.: Differential equations for cubic theta functions. Int. J. Number Theory **7**(7), 1945–1957 (2011)
8. Ramanujan, S.: On certain arithmetical functions. Trans. Camb. Philos. Soc. **22**, 159–184 (1916)
9. Sebbar, A., Sebbar, A.: Eisenstein series and modular differential equations. Can. Math. Bull. **55**(2), 400–409 (2012)
10. Toh, P.: Differential equations satisfied by Eisenstein series of level 2. Ramanujan J. **25**, 179–194 (2011)
11. Zudilin, W.: Thetanulls and differential equations. Mat. Sb. **191**(12), 77–122 (2000)
12. Zudilin, W.: The hypergeometric equation and Ramanujan functions. Ramanujan J. **7**(4), 435–447 (2003)

PHOTOCATALYTIC ANALYSIS ON ZNO NANO POWDER ON THE DEGRADATION OF AZO DYE ACID: A REFERENCE REVIEW

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Abstract- ZnO nano-powder with crystallite size in the range 55-97 nm was prepared by combustion technique and was characterized by powder X-ray diffraction, scanning electron microscope, and Fourier transform infrared spectroscopy. Photo catalytic degradation of acid orange 8 (AO_8) dye was carried out with ZnO nano-powder. The effect of amount of ZnO, concentration of the dye, pH and irradiation time on photo catalytic degradation of AO8 is studied. The results reveal that the maximum decolonization (more than 70%) of dye occurred with ZnO catalyst in 35 min of stirring at alkaline pH.
Keywords: ZnO, Photo-catalysis, Azo dye degradation, Acid orange 8.

1. INTRODUCTION

A variety of dyes used in textile industry usually have a synthetic origin and multifaceted aromatic molecular structures which make them more stable and more complicated to be biodegraded. Colored industrial effluent is the most apparent indicator of water pollution, and the discharge of highly colored synthetic dye effluents is aesthetically displeasing and cause considerable damage to the aquatic life.

The effluents are strongly colored which not only created environmental and aesthetic problems but also posed a great potential toxic threat to ecological human health as most of these dyes are toxic and carcinogenic.

Predominantly azo dyes which contain one or more nitrogen to nitrogen double bonds (-N=N) constitutes a significant portion that is widely used in industries today.

The strong electron-withdrawing character of the azo group stabilizes these aromatic pollutants against conversions by oxygenizes. Therefore, azo dyes are not readily degraded under aerobic conditions. Hence, removal of azo dye effluents generated by food and dye industries is a main issue in wastewater treatment. These effluents are commonly treated using physicochemical methods such as adsorption, photo-degradation [4-7], and coagulation.

All of these processes are expensive and complicated. Therefore, there is a need for economical and simple methods to abolish harmful dyes in effluents [1,8]. Dyes can be degraded in the presence of photo-catalyst on irradiation with visible light because of their absorption in the visible region [9]. Photo-assisted degradation of some dyes have been investigated [10-12].

Acid orange 8 (AO8) is one of the important monoazo dyes and possesses a simple structure. It is used in the form of its salts in dyeing, as an intermediate in the manufacture of acid yellow, diazo dyes, and indulines [1]. Thus, keeping the hazardous nature and harmful effects in view, it was considered worthwhile to make systematic efforts to degrade AO8 from aqueous medium using low-cost ZnO nano-powder.

In the light of these considerations, we report herein, the hitherto unreported results on the photo-catalytic degradation of AO8 under solar irradiation were studied. The aim of this work is to study the effect of (i) catalyst concentration, (ii) dye concentration, and (iii) pH of the dye solution on the degradation of the dye.

2. EXPERIMENTAL

Zinc nitrate (Zn $(NO_3)_2.4H_2O$) (Merck) and AO8 (SRL) and were used as received. Commercial sugar ($C_{12}H_{22}O_{11}$) was used as fuel. Double distilled water was used in this work.

2.1. Techniques

The powder X-ray diffraction patterns of ZnO samples were obtained using a Philips PW/1050/70/76 X-ray diffract meter using Cu Kα radiation at a scan rate of

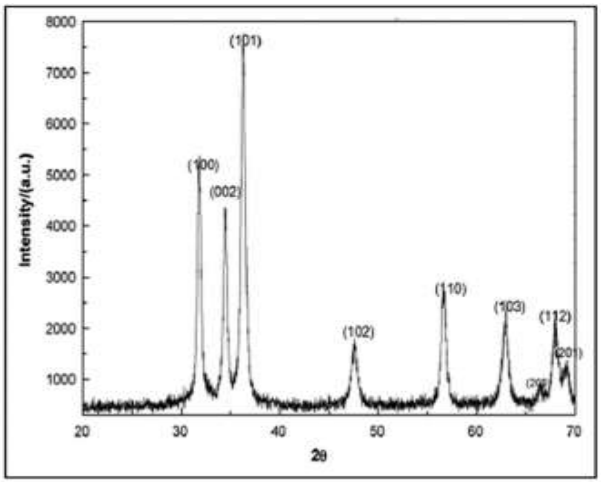

Figure 1: Powder X-ray diffraction of ZnO.

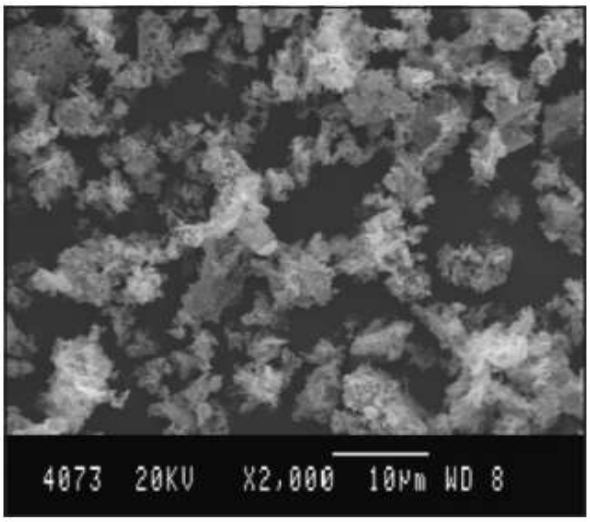

Figure 2: Scanning electron microscope images of ZnO sample calcined at 500°C.

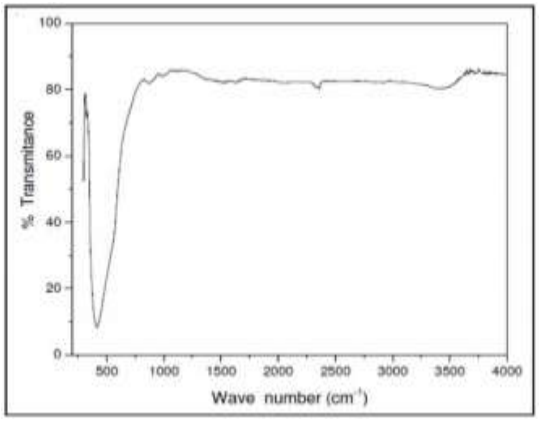

Figure 3: Fourier transform infrared spectrum of as formed ZnO nano powder.

2°/min (Figure 1). The morphology of powders was examined using JEOL (JSM-840A) scanning electron microscopy. Fourier transform infrared (FTIR) spectra were recorded using Nicollet IMPACT 400 D FTIR spectrometer, in the range 400-4000 cm^{-1} as KBr pellet. The absorption spectra were recorded with a UV-visible spectrophotometer (Elico SL-159).

2.2. Preparation of Catalyst ZnO

Nano Powder Zinc nitrate (5.0 g) and sugar (1.2 g) taken in a cylindrical pyrex dish of 300 mL capacity were dissolved in a minimum quantity of double distilled water and dispersed well using a magnetic stirrer for 0.5 h. The resulting homogeneous redox mixture was rapidly heated in a muffle furnace maintained at 300±10°C. The redox mixture boils, froths, and dehydrates forming a honey like gel which burns with an incandescent flame. The product of combustion is voluminous, fluffy, and porus. The gaseous products formed such as oxides of nitrogen by the thermal decomposition of metal nitrates at 300±10°C are hypergolic.

3. RESULTS AND DISCUSSION

3.1. Photo-catalytic Activity of ZnO Nano Powder

To estimate the photo-catalytic activity of ZnO, degradation of AO8 was undertaken. A typical experiment constitutes 100ml of 10ppm dye solution and 0.2g of catalyst taken in a glass reactor. The mixture was stirred for 30min to establish the adsorption equilibrium between the dye molecules and the catalyst surface.

The solution was irradiated with solar light. Experiments were carried out during the summer season between 11.30am to 2.30pm during which fluctuation in the solar intensity is minimum. The decolourization efficiency (%) was calculated as follows:

$$\%\ \text{Degradation} = \frac{C_0 - C}{C_0} \times 100$$

Where, C0 is the initial concentration of dye and C is the concentration of dye after photo irradiation. Similar experiments were carried out by varying the pH of the solution, concentration of dye and catalyst (Figures 4 and 5).

4. CONCLUSIONS

Nano ZnO powder has been synthesized by a simple, quick and novel low-temperature solution

combustion method and was employed as a catalyst for the degradation of AO8 dye. It was found that the dye is completely decomposed on irradiation in the presence of the ZnO catalyst at alkaline pH under solar light irradiation in about 35min stirring time.

REFERENCES

1. H. Zollinger, (1981) Color Chemistry: Synthesis, Properties and Applications of Organic Dyes and Pigments, New York: VCH.
2. J. Perkowski, S. Ledakowicz, (2002) Decomposition of anthraquinone dye acid blue 62 by the decoloration of textile wastewater, Fibres and Textiles in Eastern Europe, 10: 68-72.
3. C. I. Pearce, J. R. Lloyd, J. T. Guthrie, (2003) The removal of colour from textile wastewater using whole bacterial cells: A review, Dyes Pigments, 58: 179-196.
4. G. D. A. Umbuzeiro, H. S. Freeman, S. H. Warren, D. P. De Oliveira, Y. Terao, T. Watanabe, L. D. Claxton, (2005) The contribution of azo dyes to the mutagenic activity of the Cristais River, Chemosphere, 60: 55-64.
5. J. Oakes, P. Gratton, (1998) Kinetic investigations of Azo-dye oxidation in aqueous-media, Journal of the Chemical Society, Perkin Transactions, 2: 2201-2206.
6. O. Ligrini, E. Oliveros, A. Braun, (1993) Photochemical processes for water-treatment, Chemical Reviews, 93: 671-698.
7. J. J. Roxon, A. J. Ryan, S. E. Wright, (1967) Reduction of water-soluble Azo dyes by intestinal bacteria, Food and Cosmetics Toxicology, 5: 367-369.
8. C. R. Lee, H. W. Lee, J. S. Song, W. W. Kim, S. Park, (2001) Synthesis and Ag recovery of nanosized ZnO powder by solution combustion process for photocatalytic applications, Journal of Materials Synthesis and Processing, 9: 281.
9. S. P. Buthelezi, A. O. Olaniran, B. Pillay, (2012) Textile dye removal from waste water effluents using Bio flocculants produced by indigenous bacterial isolates, Molecules, 17: 14260-14274.
10. J. Sima, P. Hasal, (2013) Photocatalytic degradation of textile dyes in a TiO2/UV system, Chemical Engineering Transaction, 32: 79-84.
11. L. K. Konstantinouy, T. A. Albanis, (2004) TiO2-assisted photocatalytic degradation of Azo dyes in aqueous solution: Kinetic and mechanistic investigations, Applied Catalysis B: Environmental, 49(1): 1-14.
12. T. Wu, G. Liu, J. Zhao, H. Hidaka, N. Serpone, (1998) Serpone, photoassisted degradation of dye pollutants V self photosensitized oxidative transformation of rhodamine B under visible light radiations in aqueous TiO2 dispersions, Journal of Physical Chemistry B, 102(30): 5845-5851.

A STUDY ON IMPORTANCE OF ENGLISH LANGUAGE FOR EDUCATION

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1. INTRODUCTION

While English isn't the authority language of India, it has turned into the language of the decision world class. Familiarity with English is very pursued and carries with it the potential for social portability to the oppressed areas of society. Be that as it may, is English-medium instruction the arrangement?

The United Nations observes English Language Day on 23 April, the date generally saw as both the birthday and date of death of William Shakespeare. Celebrating" language days" for every one of its six authority dialects, the associations expressed reason in doing as such is to "commend multilingualism and social variety." In the Indian setting, the English language had been perceived for true purposes in the Constitution for a time of 15 years and keeps on getting a charge out of such acknowledgment under the Official Languages Act, 1963. While the "public language" issue was petulant during the Constituent Assembly discussions and keeps on excess agitated even today, the utilization of English remaining parts common, for true purposes as well as in instruction and public talk. An expected 10% of India's populace can communicate in the language.

2. ENGLISH AS THE LANGUAGE OF THE RULING ELITE

English is frequently perceived in India as the language of pioneer British standard, yet does its utilization in postcolonial India bear the tradition of expansionism?

2.1 Tejaswini Niranjana (1990) composed:

The presentation of English training in India is inseparable from the course of coercion/ subjectification under expansionism. The frontier "subject"; built through practices or innovations of force/ information, takes part energetically ... in his/her inclusion into the prevailing request. As the antiquarian Ranajit Guha recommends, English didn't owe its significance as "an image of force" inside the instruction framework to true sponsorship

alone. English turns into a sign of status through an intricate creation of the provincial subject inside numerous talks and on different destinations.

3. ENGLISH SPEAKERS

A class partitioned arrangement of schooling has assumed a focal part in embellishment the cycles and examples of lopsided turn of events and d is/liberation in postcolonial India. In quite a bit of metropolitan India, there win two frameworks of training—English-medium and vernacular-medium.

On a singular level, English-medium schooling has been a pass to vertical versatility in Indian culture. At the cultural level, English-medium schooling has assumed a basic part in delivering what Kothari (1993) calls a modernized techno administrative tip top that keeps on having lopsided impact in molding the verbose territory of advancement, and along these lines arrangements and projects that influence the social texture of the country. Less noticeably, English-medium schooling extends social cracks in Indian culture by making and supporting a social, social, monetary, and digressive split between the English-taught and he larger part.

Further, there is protection from the mainstreaming of English language training by the decision Brahmanical first class in the country for the sake of insurance of provincial dialects. However, the pietism in such opposition is plainly obvious. Setting the onus of ensuring the native language on the minimized gatherings is one more apparatus of underestimation in the possession of the predominant gatherings. Refering to the case of the presentation of English as the vehicle of guidance in government schools from Class 1 to Class 6 by the Y S Jagan Mohan Reddy drove Yuvajana Sramika Rythu Congress Party government in Andhra Pradesh clarified.

Subsequent to climbing to control, Reddy is, indeed, respecting his survey guarantee of English-medium schools not with standing mounting analysis from the resistance and a segment of the general public which fears the deficiency of character and culture because of this move. Countering their analysis, he requested that his faultfinders introspect with regards to whether they send their kids and grandkids to English-or Telugu medium schools. The majority of the pundits is from special foundations, and sends their youngsters to English-medium tuition based schools. Their contention is that the presentation of English-medium schools will end up being an attack on Telugu language and culture. Nonetheless, it is astounding that they expect simply the minimized to assume the liability of ensuring society and custom while the rich

keep on partaking in the products of innovation riding on quality training in English.

3.1 Peggy Mohan (2014) Likewise Composed:

What we have made is an India where the first class have evacuated to English, passing on it to the poor to keep our dialects "warm" for us in our nonappearance. It isn't unexpected, then, at that point, that the poor have observed our prosperity and chosen to follow us up the natural way of life into the favored universe of English. While they might realize that they are forsaking their legacy by putting their youngsters right on time into English-medium non-public schools, they are optimistic with regards to this, deciding to get by in the current milieu than being hesitant overseers of neighborhood dialects that have given them priceless minimal as far as business.

4. EMANCIPATORY POTENTIAL OF ENGLISH

While the dependence of the decision exclusive classes on English isn't being referred to, its "official status" is questionable. It doesn't find a spot in the booked dialects list. All things considered, Hindi is perceived as the authority language of the country and Article 343 of the Constitution and Sanskrit is given supremacy with regards to giving the jargon to Hindi. The notice of English in this sacred plan is portrayed by its brief nature since Article 343 accommodates its continuation being used for just 15 years. Setting English external what he named the "chaturvarna (four-level request) of dialects" in India (with Sanskrit, Hindi, the planned, and the non-booked dialects possessing different rungs of the stepping stool), Hany Babu M T (2017) composed:

While authoritatively, English is treated as an undetectable or distant language, it keeps on ruling the open arena and having no admittance to great English is regularly the determinants of social versatility, wherefore the oppressed think that it is difficult to get up to speed as the state has no commitment to give schooling in English to them.

5. FINANCIAL BENEFITS AND ENGLISH LEARNING ASPIRATION

By and large, English has been the safeguard of the first class and special in India. It's obviously true that the primary individuals to profit from English training in India were the special and elites, who could send their youngsters to English medium schools and gather social capital after some time. One necessities to take note of that it isn't just English as a language of guidance however the manner in which it is spoken (highlight) that makes a chain of

command in the general public and permits the advantaged to accumulate massive social capital (Bourdieu and Passeron 1977) to be utilized for social versatility.

The social capital of English converts into social and monetary advantages because of the transcendence of "networks" in getting to vocation openings in India. The equivalent has likewise been valid in a worldwide set-up since the approach of progression during the 1990s. Faust and Nagar (2001) clarified:

This social, social, monetary and political fracture prompts progressively inconsistent admittance to assets and force in a time of developing transnational organizations among the tip top. Under the changing exchange system, the world class consider their prospects to be attached to the worldwide economy and progressively isolates from the eventual fate of the everyday citizens. Truth be told, a portion of individuals we met in 1995-96 connected a consistently expanding strength of English with the rebuilding of the worldwide and public economies, and the globalization of culture wherein the English talking public tip top advantage from transnational free enterprise while the conventional individuals are forgotten about. This opinion reverberates with GPD's (1996) perspective on elites as a social compradore who communicate in English to work with multinationals and talk the vernacular to hypnotize the clueless masses.

5.1 They Added:

As English progressively turns into "the language of social benefit and energizing financial freedoms," those informed in state-run vernacular schools face "a persistently uncalled for impulse to partake in the standard market economy from a feeble position" (Kumar 1996:71). The unjustifiable social and financial drawback looked by non-English speakers is the justification behind the broad allure of the language among the general population. This was exacerbated because of the arising openings introduced by a globalized economy.

India's administration drove development has profited from the commodity of high-gifted administrations helped by knowledgeable, English-talking experts who have been instrumental in India's rise in programming and data and correspondences innovation (ICT)-empowered administrations (Dahlman 2010). While these experts were helped by tertiary instruction, even positions with lower levels of instructive necessity these days frequently need some information on English. Being familiar with English (contrasted with not talking any English) was found to increment time-based compensations of men by 34%

(Azam et al 2013). An EPW article (2003) mentioned a comparable objective fact in regards to the restored interest for English language instruction among areas of the Indian public because of the multiplication of occupations in the business interaction reevaluating (BPO) and data innovation empowered administrations (ITeS) area in the mid 2000s.

The Indian working class and the individuals who sought to working class status accepted English medium schooling as the main sort of training worth having. There can be little uncertainty that information on English is an essential for acquiring a talented occupation in the globalizing economy. Because of US predominance of the worldwide economy, English has turned into the language of world business. Individuals all throughout the planet are learning English, in China, in Russia, in Korea and in Latin America other than in the countries that were colonized by the British. There can be no squabble with the attractiveness of learning English. The BPO blast lays weight on learning English in the customary way as well as on dominating English discourse and the various phrases of the language. This clarifies the mushrooming of 'Communicated in English' courses and organizations offering such courses around the nation's towns.

6. ENGLISH AS A MEDIUM OF INSTRUCTION

While the Andhra Pradesh High Court had struck down the Andhra Pradesh government's organization making English medium required in all administration schools from Classes 1 to 6 (naming it illegal) and the destiny of the request is not really settled by the Supreme Court, whether or not English ought to be a vehicle of guidance is appropriate.

The justification behind the mass flight of the first class from government schools is frequently credited to the way that these couldn't offer English-medium instruction, and this, many accept, has prompted the crumbling of government schools. As the first class abandoned government schools for costly private English-medium schools, government schools have wound up as the main choice for poor people. With the falling instructive norms in government schools and an ensuing ascent in optimistic levels of poor people, poorly equipped private and unnoticed English-medium schools have started to mushroom the nation over. Hence, there has been an expansion in the movement of understudies from government to private English-medium schools at the rudimentary level over the most recent twenty years after the 1990s (Mukhopadhyay and Sarangapani 2018).

6.1. Concluding from Survey Findings Based on LCPS in Delhi and Noida, Endow Wrote

We have seen that imparting education at the primary level through an unfamiliar language poses barriers for children attending English medium LCPS, and does not develop their agency in using English for communication. While reading ability was demonstrated to be good, the comprehension, be it in terms of simple words, sentences or passages from textbooks, was quite poor. Their agency in using English on their own was revealed to be extremely limited.

REFERENCES

1. Azam, M, A Chin and N Prakash (2013): "The Returns to English–Language Skills in India," Economic Development and Cultural Change, University of Chicago Press, Vol. 61, No 2, pp 335–67.
2. Baird, R (2009): "Private Schools for the Poor: Development, Provision and Choice for India—A Report for Gray Matters Capital," May, http://www.dise.in/Downloads/Use%20of%20Dise%20Data/Ross%20Baird.pdf. Bhattacharya, Usree (2013): "Mediating Inequalities: Exploring English-medium Instruction in a Suburban Indian Village School," Current Issues in Language Planning, Vol. 14, No 1, pp 164–84.
3. Bourdieu, Pierre and Jean-Claude Passeron (1977): Reproduction in Education, Society and Culture, London: Sage Publications.
4. Dahlman, C J (2010): "Education and Growth of Services," The Service Revolution in South Asia, E Ghani (ed.), New Delhi: Oxford University Press.
5. Dash, Santosh (2009): English Education and the Question of Indian Nationalism: A Perspective on the Vernacular, Delhi: Aakar.
6. Daswani, C J (ed) (2001): Language Education in Multi-lingual India, New Delhi: UNESCO. GPD (1996): 'Language and Politics', Economic and Political Weekly, 31(22):1299.
7. Karopady, D D (2014): "Does School Choice Help Rural Children from Disadvantaged Sections?" Economic & Political Weekly, Vol. 49, No 51, pp 46–53.
8. Kumar, Krishna (1996): Learning from Conflict, Orient Longman, New Delhi. Mukhopadhyay, Rahul and Padma M Sarangapani (2018): "Education in India between the State and the Market-concepts Framing the New Discourse: Quality, Efficiency, Accountability," School Education in India: Market, State and Quality, New York: Routledge, pp 1–27.
9. NCERT (2006): National Focus Group Position Paper on Teaching of English, National Council of Educational Research and Training, New Delhi.
10. (2012): "Teaching of English at Primary Level in Government Schools," National Council of Educational Research and Training, New Delhi: Ed.CIL India and NCERT. Orsini, Francesca (1995): "Why Tulsi?," Seminar, No 432, pp 55–58.

CONCEPTUAL RESEARCH BASED ON VIRTUAL USER INTERFACE

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Abstract- In this world of technology, the interface between man and machine is very useful in making things easier and is on ascend. This can be of great use in almost all sectors, more specifically the education field where we can make use of this for teaching and other applications in a way to improve and make class sessions more interesting for students. This is a world of technology, paved way for smart boards, which made these work easier. Nevertheless, these solutions to problems are of high cost, thus making their movement slow, in most of the countries. In these circumstances, we present our paper of Virtual User Interface, which consists of minimum hardware requirements of low cost with help of free open software available. The hardware consists of an IR-cam and a pointing device to detect the user interactions on a surface and the system is compatible with any video projectors.
Keywords: IR Pen, Raspberry Pi, IR Camera, Virtual user interface.

1. INTRODUCTION

The rapid changes occurring in information and communication technologies have changed the traditional classroom environment and teaching methods. Projectors, Internet linked computers in classrooms, mobile phones, digital cameras and video recorders affect many aspects of education ranging from student projects to lesson presentations. Another aspect of the last 20 years has been the interactive whiteboard which consists of a connection between a computer, a projector and a touch screen electronic whiteboard. These solutions are usually expensive, making their acceptance slow. In this context, we present an open-source interactive whiteboard along with low-cost hardware requirements. Here, we developed a low cost virtual interface using easily available hardware devices namely, a Raspberry-Pi with an infra red camera, a video projector and an IR pointing device such as LED pen. In the current scenario, the existing system for presentation and teaching aids is the chalk and board system. The problems faced in this system are that it may cause dust allergies and it may

also make the system less interactive and the class sessions boring. Also while using markers to write we need to replace it each time it gets over. In short, it's an ineffective and inefficient way of approach. To replace this and make the system more advanced and the classes more interactive, we implemented the VUI.

2. REQUIREMENT ANALYSIS

Requirements analysis and validation is a process of refinement, modelling and specification of the already discovered user requirements.

2.1. User Requirements

On the basis of requirement survey conducted among the users, we have reached to a conclusion that more than 90% of the students are interested to attend the classes in a smart classroom. 95% of teachers stated that projector and interactive board made their teaching more efficient and effective. 80% people believe that interactive boards will enhance the student abilities. Another feature people wanted was to make the interactive board touch sensitive.

2.2. Project Requirements

On the basis of the requirements demanded by the user the following project requirements were found out:

- Reduce the cost of interactive tool.
- Compatible with traditional projectors.
- High clarity and visibility of the board.
- Additional facilities like drawing tool, internet connectivity etc.

2.3. Specific Requirements

While working as teaching aid, only a projector and the standalone embedded computer unit is required. While used as presentation aid, it requires the embedded computer unit along with a computer as the video source. Software interfaces for communication between the IR sensor and the raspberry pi is required and also a software interface should be developed for the communicating RF signals from the pointing device.TCP/IP, UDP protocols are used for communication.

3. DESIGN

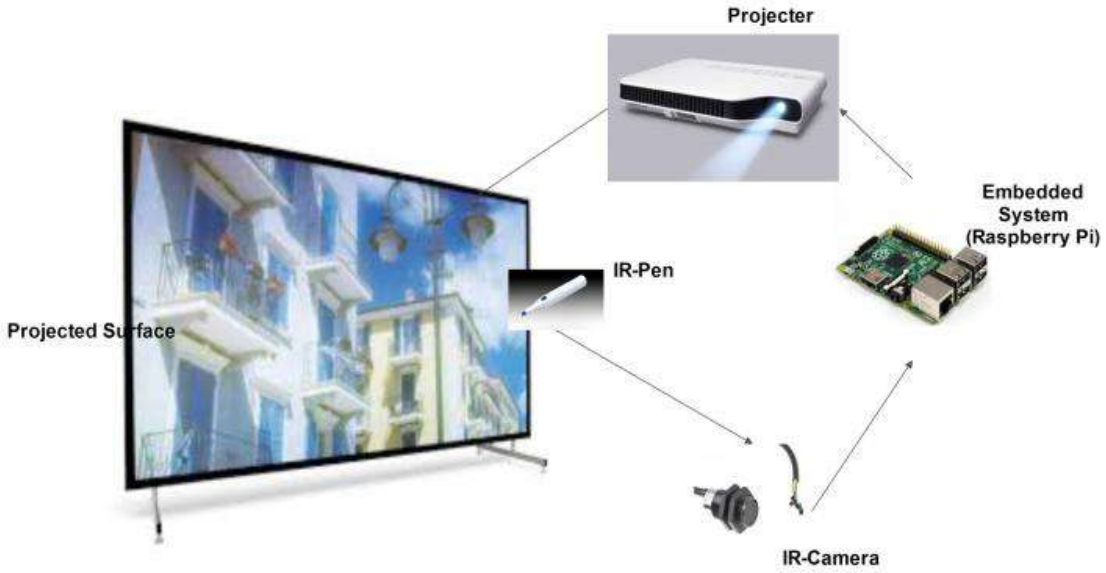

Fig. 1. *System Overview* The system has been designed to serve both as an electronic whiteboard and wireless desktop mirroring device. For implementing the touch interface, pointing device along with IR cam is used. The pointing device is enabled with a left click and right click button. With each button press a unique digital code is transmitted, this code is mapped to corresponding left click and right clicks in mouse driver. Also the coordinates of clicked position is identified by the IR cam and the suitable transformations are applied to obtain the relative coordinates with the edges of the projected board.

4. CONCLUSION

As specified by the requirements, the hardware has been completed successfully. We developed an embedded system with optimal use of hardware, which provides an interactive touch interface at a considerable cost. We believe that the proposed solution will represent a valuable contribution to ease the access in the user interface and increase widespread use of the solution with obvious benefits.

We placed the IR camera about 50 cm from the screen at an angle of 30 degree, which created an IR field. As the changes were made by the IR pen, it was detected by the IR camera and the corresponding code was run and the setup was implemented.

In the present context, there are several similar systems available, but they are costly and people with fragile economy cannot afford such systems. Our project provides more flexible and friendly interface with very low cost. The concept of Virtual User Interface is a major step towards the development of smart classrooms and interactive conference halls. The ease of presentation and user

interaction will make a significant change in the field of education, finance and other day to day activities. The future enhancements of the proposed system that we have planned are to extend the proposed system to all platforms and operating systems.

REFERENCES

1. Shuai Zhang, Wenrui He, Qiao Yu and Xiaojuan Zheng, Low-cost interactive white- board using the Kinect, pages 1-5, Image Analysis and Signal Processing (IASP), International Conference on 9-11 Nov. 2012.
2. www.raspbian.org, Raspbian, 2014.
3. Mark Summerfield, Rapid GUI Programming with Python and QT.
4. Chao-Hsuing Tseng, Yung-Chiang Wei, Design and implementation of the Multi- Touch Tables.
5. Gigabit Ethernet Based Image Acquisition System for IR Camera, Sixth International Conference on Computational Intelligence and Communication Networks, 2014.
6. Internet of Things approach for motion detection with Raspberry Pi, International Conference on Intelligent Computing and Internet of Things (ICIT), 2015
7. Think Python, O'Reilly, 2005
8. Getting started with Raspberry Pi, O'Reilly, 2013.
9. www.numpy.org/scipy.org

A REFERENCE REVIEW ON DSP BASED MATHEMATICAL CONCEPTS

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Abstract - Optimization of variety of objective functions using graph cuts in different move spaces is studied in detail in the paper. The study concludes that, an objective function can be minimized using graph cuts provided it is FNO- optimizable. Characterizations of two classes of FNO- optimizable functions (O^2 and O^3) are given and many mathematical results in this regard are proved in the paper. These characterizations contribute in easily identifying the image processing problems which can be addressed through graph cuts notion. However, further exploration of the concepts studied/ defined in the paper is required to strengthen the designed mathematical framework. Due to programming limitation on our part, we could not construct a computationally time-effective computer program encoding the graph-cuts model. There is a good scope of improvement in the implementation of graph theoretic models designed in the present work on appropriate programming platform.
Keywords: Theoretical DSP, graph Cut.

1 PRELIMINARIES

1.1 Graph Cuts for Binary Optimization

As a binary optimization technique, graph cuts will be discussed in this section. In reality, minimum -cut/maximum-flow algorithms are essentially binary techniques, as they are based on the concept of minimization. Binary issues, then, are the most fundamental example of graph cutting.

1.2 An Introduction to Mathematical Image Processing

In addition to medical imaging, astronomy, astrophysics and surveillance, image processing is also used in video compression and transmission. Signals are images in one dimension, whereas images in another dimension are termed images. We deal with planar images in two dimensions, and volumetric images in three dimensions (such as MR images). Alternatively, they can be colors images or grayscale images (single-

valued functions) (vector-valued functions). As a result of noise, blur, and other flaws, captured images are typically deteriorated. Preprocessing is thus required before any further analysis and feature extraction can be conducted on these pictures.

While taking this course students learn how to mathematically express the following processes: denoising and deblurring of images; augmentation of images; and edge detection. As far as spatial filtering is concerned there will be incomplete imitative, gradients, the Laplacian or their separate estimates by limited dissimilarities, averaging filters and order figures filters as well as difficulty. As far as the incidence domain is concerned, there will be Fourier transforms, low-pass and high-pass filters, as well as zero-crossings of the Laplacian, among others.

2 STATISTICAL JUSTIFICATION OF THE APPROACH

In the study, we attempt to solve the problem of pixel labeling by objective function minimization approach. At the first glance, the approach seems to be a deviation from the main goal but, it can be defended by Baysian statistics. In this section, prerequisites of Baysian statistics have been briefly discussed.

3 GRAPH CUT MODEL FOR UNIFORMLY SMOOTH STRUCTURE

In this model, the structure constraint is encoded by the sub - function $\Psi_{v,w}(x_v, x_w)$ as linear relationship of neighbouring pixels with corresponding weights. It is defined by $\Psi_{v,w}(x_v, x_w) = c(v,w)\left|x_v - x_w\right|$. Where $c(v,w)$ is the constant corresponding to pair of pixels v and w. With the expression of structural constraint defined as above, the objective function to be minimized takes the form,

$$O(X) = \sum_{v} \varphi_v(x_v) + \sum_{\{v,w\}\in N} c(v,w)|x_v - x_w| \qquad (3.1)$$

The graph cuts can efficiently minimize the objective function (3.1) globally.

4. DEFINITION OF THE PROBLEM TO BE ADDRESSED

We transform the problem of image binarization into an equivalent optimization problem and attempt to solve it through network flow terminology (i.e. Graph cuts). Max flow min- cut theorem given by Ford and Fulkerson plays a very crucial role in the model as in all graph cuts models.

A digital image of text document (i.e. scanned text) is composed of rectangular arrangement of pixels, each of which represents intensity. Binarization is a process of defining a function $X: V \to \{t', b\}$ (where V is the set of all pixels of the textual image) which reassigns a binary value t' (Text) or b (Background) to every pixel v of the image, subject to the given data. The choice of the function depends on two constraints. 1) The neighboring pixels should be assigned similar value by the function almost everywhere with the exception of the pixels representing boundary of the text. 2) The assignment should be made in light of the data given by scanned image. We have employed these constraints to construct the function. The first step includes construction of an objective function considering the constraint of the problem. Let V be a set of all pixels of the image and $\{g_v : v \in V\}$ be the set of grey values of pixels. The objective function $O: \Omega \to \mathbb{R}$ provides the measure of inappropriateness for every possible binarization function X from Ω and plays a crucial role in the selection of most suitable function

$$i.e.\ O(X) = \sum_{\substack{(u,v)\in N \\ u,v\in V}} kp_{uv} + \sum_{v\in V} |X_v - g_v| \qquad (4.1)$$

4.1 Theoretical Justification of the Model

In this section, we will prove that, the model efficiently minimizes the objective function and produces the binarization of the image which has minimum value under objective function (4.1). This also proves the superiority of the model among prevailing binarization techniques in light of the objective function.

Theorem 4.1.1

For any scanned textual image, the set Ω of all corresponding binarization functions and the set C of all cuts on the network flow corresponding to the image are in one to one correspondence.

Proof: Let $X: V \to \{t', b\}$ be a binarization function corresponding to the given scanned image. Then, there exists a cut $C = \{S, T\}$ on the network flow corresponding to the image defined as follows:-

$$S = \{v | X_v = 0\} \; and \; T = \{v | X_v = 255\}$$

Note that, $X_v = 0$, when $X(v) = t'$ and $X_v = 255$ when $X(v) = b$.

This proves that, every binarization function gives rise to a cut on the network flow constructed for the textual image under consideration.

Conversely, let $C = \{S, T\}$ on the network flow for the given textual image. Then, we can define X as follows:

$$X(v) = t', if\ v \in S$$
$$X(v) = b, if\ v \in T$$

This proves the theorem.

THEOREM 4.1.2

The minimum cut on the network flow constructed for the textual image gives binarization which minimizes the objective function.

Proof: let X be the binarization corresponding to any cut C of the network flow. First, we show that, cost of the cut C is O(X).

Note that, cost of any cut is sum of weights of the edges which are member of the cut set. In case of our network flow, there are two types of edges: (i) non-terminal edges e^n_{uv} joining neighboring vertices u and v of the network flow (ii) Terminal edges e^s_v and e^t_v connecting vertex v with the terminal vertices s and t respectively.

Thus, the cost of C is given by,

$$|C| = \sum_{\substack{(u,v)\in N \\ e^n_{uv}\in C}} |e^n_{uv}| + \sum_{e^s_u \in C} |e^s_u| + \sum_{e^t_u \in C} |e^t_u|$$

5 CONCLUSION

In the paper, various graph theoretic models involving graph cuts are studied. Graph cut models for mainly three types of structures viz. uniformly smooth structure, segment wise smooth structure and universally constant structure are studied in the paper. Optimization of variety of objective functions using graph cuts in different move spaces is studied in detail in the paper. The study concludes that, an objective function can be minimized using graph cuts provided it is FNO-optimizable. Characterizations of two classes of FNO- optimizable functions (O^2 and O^3) are given and many mathematical results in this regard are proved in the paper. These characterizations contribute in easily identifying the image processing problems which can be addressed through graph cuts notion. However, further exploration of the concepts studied/ defined in the paper is required to strengthen the designed mathematical framework. Due to programming limitation on our part, we could not construct a computationally time-effective computer program encoding the graph-cuts model. There is a good scope of improvement in the implementation of graph theoretic models designed in the present work on appropriate programming platform.

REFERENCES

1. A. Ben-Israel and T. N. Greville. Generalized Inverses. Springer-Verlag, 2003.
2. A. Bjork. Numerical Methods for Least Squares Problem. SIAM, 1996.
3. A. Blake and A. Zisserman. Visual Reconstruction. MIT Press, 1987.
4. A. Goldberg and R. Tarjan. A new approach to the maximum flow problem. Journal of the Association for Computing Machinery, 35(4):921 940, October 1988.
5. A. Laurentini. The visual hull concept for silhouette-based image understanding. IEEE Transactions on Pattern Analysis and Machine Intelligence, 16(2):150 162, February 1994.
6. A. Simon, J.C. Pret, and A.P. Johnson, A fast algorithm for bottom-up layout analysis, IEEE Trans Pattern Anal Mach Intell 19 (1997), 273 277.
7. A. V. Goldberg and R. E. Tarjan. A new approach to the maximum- flow problem J. ACM, 35(4):921 940, 1988.
8. A.K. Jain and S. Bhattacharjee, Text segmentation using Gabor Filters for automatic document processing, Mach Vis Appl 5 (1992), 169 184.
9. A.K. Jain and Y. Zhong, Page segmentation using texture analysis, Pattern Recognition 29 (1996), 743 770
10. Alexander Schrijver. A combinatorial algorithm minimizing sub modular functions in strongly polynomial time. Journal of Combinatorial Theory, B80:346 355, 2000.
11. B. Gold lucke and M.A. Magnor. Joing 3D-reconstruction and background separation in multiple views using graph cuts. In IEEE Conference on Computer Vision and Pattern Recognition, pages 683 688, 2003.
12. B. K. P. Horn and B. Schunk. Determining optical flow. Artificial Intelligence, 17:185 203, 1981.
13. B. Thirion, B. Bascle, V. Ramesh, and N. Navab. Fusion of color, shading and boundary information for factory pipe segmentation. In CVPR, pages 349 356. IEEE, 2000.
14. B. V. Cherkassky and A. V. Goldberg. On implementing push-relabel method for the maximum flow problem. Algorithmic a, 19:390 410, 1997.
15. B. Wang, X.-F. Li, F. Liu, and F.-Q. Hu, 2005. Colour text image binarization based on binary texture analysis, Pattern Recogn Lett 26 (2005), 1650 1657.
16. Boris Zalesky. Fast algorithms of bayesian segmentation of images. arXiv, math.PR/0206184, June 2002.
17. C. A. Cocosco, V. Kollokian, R. K. s. Kwan, G. B. Pike, and A. C. Evans. Brain web: Online interface to a 3d mri simulated brain database. Neuro Image, 5:425, 1997.
18. C. Buehler, S. J. Gortler, M. Cohen, and L. Mc Mmillan. Minimal surfaces for stereo vision. In European Conference on Computer Vision, volume 3, pages 885 899, 2002.
19. C. Strouthopoulos and N. Papamarkos, Multi-thresholding of mixed type documents, Eng Appl Artif Intell 13 (2000), 323 343.
20. C. Strouthopoulos, N. Papamarkos, and A. Atsalakis, Text extraction in complex colour documents, Pattern Recognition 35 (2002), 1743 1758.
21. C. Thillou and B. Gosselin, Colour binarization for complex camera-based images, Color imaging X: Processing, hardcopy, and applications, Proceedings of the Electronic Imaging Conference of the International Society for Optical Imaging (5667), 2005, pp. 301 308.

22. C. Wolf, J. Jolion, and F. Chassaing. Text localization, enhancement and binarization in multimedia documents. ICPR, 4:1037 1040, 2002.
23. C. Wolf, J. Jolion, and F. Chassaing. Text localization, enhancement and binarization in multimedia documents. ICPR, 4:1037 1040, 2002.
24. D. Comaniciu and P. Meer, Mean shift: A robust approach toward feature space analysis, IEEE Trans Pattern Anal Mach Intell 24 (2002), 603 619.
25. D. Doermann, J. Liang, and H. Li. Progress in camera-based document image analysis. ICDAR, 1:606 615, 2003.
26. D. Doermann, J. Liang, and H. Li. Progress in camera-based document image analysis. ICDAR, 1:606 615, 2003.
27. D. Greig, B. Porteous, and A. Seheult. Exact maximum a posterior estimation for binary images. Journal of the Royal Statistical Society, Series B, 51(2):271 279, 1989.
28. D. M. Greig, B. T. Porteous, and A. H. Seheult. Exact maximum a posteriori estimation for binary images. Journal of the Royal Statistical Society. Series B (Methodological), 51(2):271 279, 1989.
29. D. Marr and T.A. Poggio. Cooperative computation of stereo disparity. Science, 194(4262):283 287, October 1976.
30. D. R. Karger, P. Klein, C. Stein, M. Thorup, and N. E. Young. Rounding algorithms for a geometric embedding of minimum multi-way cut in STOC '99: proceeding of the thirty first annual ACM symposium on Theory of computing, pages 668 678, New York, NY, USA, 1999. ACM.
31. D. Schlesinger and B. Flach. Transforming an arbitrary min-sum problem into a binary one. In Technical Report TUD-FI06-01, Dresden University of Technology, 2006.
32. D. Z. Chen and X. Wu. Efficient algorithm for k-terminal cuts on planar graphs. In ISAAC Proceedings of the 12th International Symposium on Algorithms and Computation, pages 332 344, London, UK, 2001. Springer-Verlag.
33. Dan Snow, Paul Viola, and Ramin Zabih. Exact voxel occupancy with graph cuts. In IEEE Conference on Computer Vision and Pattern Recognition, pages 345 352, 2000.
34. Guilherme B. Ribeiro, "Graph Signal Processing in a Nutshell", Journal of Communication and Information Systems, Vol. 33, No.1, 2018.
35. Antonio Ortega, Pascal Frossard, Jelena Kovacevic, Jose M. F. Moura, Pierre Vandergheynst, "Graph Signal Processing: Overview, Challenges and Applications", arXiv: 1712. 00468v2 [eess.SP] 26 Mar 2018.
36. Sergio Barbarossa, Stefania Sardellitti, "Topological Signal Processing over Simplicial Complexes", arXiv: 1907.11577v2 [eess. SP] 13 Mar 2020.
37. Markus Puschel, Chris Wendler, "Discrete Signal Processing with Set Functions", arXiv: 2001.10290v2 [cs.IT] 22 Oct 2020.
38. .
39. Ya Tu and Yun Lin, "Deep Neural Network Compression Technique Towards Efficient Digital Signal Modulation Recognition in Edge Device", IEEE ACCESS, Volume 7, 2019.

SYSTEMATIC REVIEW AND THEORETICAL RESEARCH FOR STERIC EFFECTS INDUCE GEOMETRIC REMODELING

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Abstract - Filopodia are ubiquitous fingerlike protrusions, spawned by many eukaryotic cells, to probe and interact with their environments. Polymerization dynamics of actin filaments, comprising the structural core of filopodia, largely determine their instantaneous lengths and overall lifetimes. The polymerization reactions at the filopodia l tip require transport of G-actin, which enter the filopodial tube from the filopodial base and diffuse toward the filament barbed ends near the tip. Actin filaments are mechanically coupled into a tight bundle by cross-linker proteins. Interestingly, many of these proteins are relatively short, restricting the free diffusion of cytosolic G-actin throughout the bundle and, in particular, its penetration into the bundle core. To investigate the effect of steric restrictions on G-actin diffusion by the porous structure of filopodial actin filament bundle, we used a particlebased stochastic simulation approach.

1 INTRODUCTION

Many eukaryotic cells project dynamic fingerlike protrusions, called filopodia, that are composed of a bundle of actin filaments enveloped by the cellular membrane. Filopodia play diverse roles across many cell types. In particular, signaling via receptors on filopodial tips allows cells to sense their environment and guide chemotaxis. Neurons use filopodia in axonal growth cones, to determine the direction of elongation and branching, as well as in dendritic spine formation. During wound healing, knitting of filopodia protruding from epithelial cells plays an important role. Filopodia are also implicated in cancer progression and metastasis because of their involvement with cell motility. They also arise in some viral infections, creating physical connections among the hosts' cells.

G-actin, an abundant and highly conserved protein, selfassembles into double helical filaments called F-actin. The latter is the fundamental building block of eukaryotic cellular cytoskeletons. F-actin structure is

polarized, with polymerization at the barbed-end being more efficient by an order of magnitude compared to the pointed-end, while having similar depolymerization rates at both ends. This asymmetry, based on the hydrolysis of ATP into ADP by actin molecules, leads to treadmilling, whereby filaments can convert chemical energy stored in ATP into mechanical work of pushing against the external resistance. Hence, actin filaments are dynamic, dissipative structures that allow for fast morphological transitions in the cellular cytoskeleton in response to external and internal biochemical and mechanical cues, mediated by a vast array of signaling and regulatory proteins.

In filopodia, which are roughly cylindrical tubes with radius R ~ 20–250nm, between 10 and 30 actin filaments are organized into parallel, tightly cross-linked structures. The filopodial lengths, L, vary considerably between cell types, ranging from a few up to several tens of microns.

2 MATERIALS AND METHODS

To investigate how steric interactions among filaments and G-actin monomers affect actin polymerization dynamics, we have developed a simulation model that incorporates excluded volume effects. In our model, we allow the elongation of actin filaments via binding of G-actin molecules. G-actin particles are allowed to move according to Brownian dynamics (BD, see below) and can bind to microfilaments when they enter the vicinity of a binding site on top of a filament, thereby elongating the filament by a length d. Note that the real mechanism of actin polymerization at the filopodial tip may be more complicated and involves additional protein complexes such as ENA/VASP and formins. Therefore, our model should be treated as effectively averaging over these details with an effective (or renormalized) polymerization rate. The simulation model proceeds via discrete time steps Dt¼100 ns, in which molecules first move via the BD step, subsequently molecules near binding sites are allowed to bind, and finally G-actin can depolymerize from the tips of filaments, freeing a molecule and reducing the filament length by d. The parameter values used in this study are summarized. We ran 200 distinct realizations of this model for 2000 s each to extract filament height trajectories over time for three different values of the interfilament spacings (taking ~50,000 CPU h).

Particle-based stochastic model for diffusion Our spatially extended stochastic model for filopodial growth is confined to a spatial domain with cylindrical

shape of variable length $L(t) = L_F(t) + 25$ nm (depending on the length of the filopodium at a time *t*, which is given by the highest filament at $L_F(t)$)and radius R = 75 nm. G-actin monomers can enter and exit the domain via the boundary the numbers in the third column indicate references for the cited parameter values.

2.1 Volume Exclusion

Filaments are modeled as rigid cylinders with a finite radius rF placed in a hexagonal arrangement (see Lateral Position of Filaments and Initial State). To account for the spatial extent of G-actin molecules (which is assumed spherical, with the same radius rF), the effective radius of filaments is given as 2rF (and diffusing molecules are implemented as points). To facilitate this study, G-actin molecules do not mutually interact, hence we do not take queuing and crowding effects into account as this would become computationally prohibitive. The concentration of G-act in is relatively small, hence we do not expect large effects from neglected interactions of G-act in molecules.

3 RESULTS

When filopodial growth dynamics are simulated using the approach described above, we find that, typically, an actin filament bundle undergoes several transitions between met stable configurations. Initially, a rapid growth phase is observed, during which all filaments grow together, followed by intermittent collapses of filaments inside the bundle. Hence, the bundle settles into different metastable steady states, during which the filament heights fluctuate around particular quasi-stationary values. These quasi-stationary heights are determined by a balance between the polymerization of G-actin and the combination of depolymerization of F-actin and retrograde flow (see Mean-Field Model). At intermediate times, large fluctuations of single filaments push the bundle out of this metastable state and one or more filaments further collapse. This collapse can be complete (a filament's height shrinks to zero and it disappears) or partial. In the case of a partial collapse, collapsed filaments fluctuate around a new, lower height, which is largely determined by a changed supply of G-actin molecules due to the new bundle geometry. Hence, the bundle height transitions due to individual filament collapses are exclusively driven by the fluctuations of G-actin's availability mediated by local steric constraints. This is in contrast to filament collapse due to the binding of capping proteins that instead directly halt filaments' polymerization propensities (20). Note that the polymerization reaction is always diffusion-

limited, because the filaments will simply grow until a balance is reached between the addition of new monomers and the reduction in length due to depolymerization and retrograde flow (19). Hence, our results are robust even for greater G-actin concentrations or large uncertainties in the polymerization rate parameter.

4 DISCUSSION

Our results show that the sterically hindered movement of free G-actin molecules leads to intriguing effects: when G-actin cannot pass between filaments in the filopodial shaft bundle, the polymerization of barbed ends of F-actin inside the bundle may not be sufficient to counteract retrograde flow. However, instead of the complete collapse of all filaments, novel metastable intermediate-height states emerge. Interior filaments that arise from an initial transient growth regime, initially have similar heights compared with the stable exterior filaments. However, height fluctuations will eventually drive single or multiple interior filaments below a critical stable height $L_{1;B}$, after which they collapse to a new metastable height $L_{1;A}$. We verified that this effect is present for different values of the interfilament spacing d observed in experimental measurements of actin bundles. Our mean-field model enables us to approximately calculate the expected critical heights for a given configuration. As these new states are only metastable, the partially collapsed filaments will eventually collapse fully and disappear. This, in turn, opens up new diffusion channels for G-actin molecules, raising their concentration in the bundle interior and thereby enhancing the stability of any remaining interior filaments. Due to the raised supply of G-actin, the average height of the topmost filament tips is raised as well.

REFERENCES

1. Mattila, P. K., and P. Lappalainen. 2008. Filopodia: molecular architecture and cellular functions. Nat. Rev. Mol. Cell Biol. 9:446–454.
2. Small, J., and K. Rottner. 2010. Elementary cellular processes driven by actin assembly: lamellipodia and filopodia. In Actin-based Motility. M.-F. Carlier, editor. Springer, New York, pp. 3–33.
3. Han, Y.-H., C. Y. Chung,., R. A. Firtel. 2002. Requirement of a vasodilator- stimulated phosphoprotein family member for cell adhesion, the formation of filopodia, and chemotaxis in Dictyostelium. J. Biol. Chem. 277:49877–49887.
4. Dent, E. W., and F. B. Gertler. 2003. Cytoskeletal dynamics and transport in growth cone motility and axon guidance. Neuron. 40:209–227.
5. Maletic-Savatic, M. 1999. Rapid dendritic morphogenesis in CA1 hippocampal dendrites induced by synaptic activity. Science. 283:1923–1927.
6. Wood,W., A. Jacinto,., P. Martin. 2002.Wound healing recapitulates

morphogenesis in Drosophila embryos. Nat. Cell Biol. 4:907–912.
7. Arjonen, A., R. Kaukonen, and J. Ivaska. 2011. Filopodia and adhesion in cancer cell motility. Cell Adhes. Migr. 5:421–430.
8. Sherer, N. M., M. J. Lehmann, ., W. Mothes. 2007. Retroviruses can establish filopodial bridges for efficient cell-to-cell transmission. Nat. Cell Biol. 9:310–315.
9. Atilgan, E., D.Wirtz, and S. X. Sun. 2006. Mechanics and dynamics of actin-driven thin membrane protrusions. Biophys. J. 90:65–76.
10. Sheetz, M. P., D. B. Wayne, and A. L. Pearlman. 1992. Extension of filopodia by motor-dependent actin assembly. Cell Motil. Cytoskeleton. 22:160–169.
11. Mogilner, A., and B. Rubinstein. 2005. The physics of filopodial protrusion. Biophys. J. 89:782–795.
12. Bray, D. 2001. Cell Movements: From Molecules to Motility. Garland Science, New York.
13. Hotulainen, P., and P. Lappalainen. 2006. Stress fibers are generated by two distinct actin assembly mechanisms in motile cells. J. Cell Biol. 173:383–394.
14. Bear, J. E., T. M. Svitkina,., F. B. Gertler. 2002. Antagonism between Ena/VASP proteins and actin filament capping regulates fibroblast motility. Cell. 109:509–521.
15. Schafer, D. A., P. B. Jennings, and J. A. Cooper. 1996. Dynamics of capping protein and actin assembly in vitro: uncapping barbed ends by polyphosphoinositides. J. Cell Biol. 135:169–179.
16. Evangelista, M., S. Zigmond, and C. Boone. 2003. Formins: signaling effectors for assembly and polarization of actin filaments. J. Cell Sci. 116:2603–2611.
17. Faix, J., D. Breitsprecher, ., K. Rottner. 2009. Filopodia: Complex models for simple rods. Int. J. Biochem. Cell Biol. 41:1656–1664.
18. Leijnse, N., L. B. Oddershede, and P. M. Bendix. 2015. An updated look at actin dynamics in filopodia. Cytoskeleton (Hoboken). 72:71–79.
19. Lan, Y., and G. A. Papoian. 2008. The stochastic dynamics of filopodial growth. Biophys. J. 94:3839–3852.
20. Zhuravlev, P. I., and G. A. Papoian. 2009. Molecular noise of capping protein binding induces macroscopic instability in filopodial dynamics. Proc. Natl. Acad. Sci. USA. 106:11570–11575.

AN ANALYTICAL APPROACHES FOR NONLINEAR DISCRETE DYNAMICAL SYSTEMS BY USING FAT

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Abstract - Infinite-dimensional system that may be used to represent propagation and transport processes as well as population dynamics (reproduction, development, and extinction). There will always be a delay in economic systems since choices and effects are separated by a non-zero time. In communication networks, the start and delivery of data is also accompanied by a non-zero time interval. The delay might be caused by a model simplification in some situations. Such systems are distinguished by the fact that their energetic may be characterized using discrepancy equations that incorporate data about the system's history. There are numerous approaches to express such systems numerically.
Keywords: Stability, Nonlinear analysis.FAT Function analytic technique.

1 THE STABILITY ANALYSIS OF LINEAR DYNAMICAL SYSTEMS WITH TIME-DELAYS

1.1 Motivation and Historical Overview

Oscillations, instability, and lack of performance are all possible outcomes when time-delay components are present in the system. Having a "little" delay might destabilize the system in some situations, while having a "large" delay can do the same thing in other situations. It's possible that as the linear time-delay system's delay is increased, there will be a series of shifts from stability to instability or vice versa. Providing the delay has a nonlinear function, a chaotic system's delayed output may be able to be stabilised for this reason, constancy investigation of time-delayed dynamical systems continues to be a extremely significant area of study and reference for researchers and practitioners.

1.2 A Dissipative Dynamical Systems Approach to the Stability Analysis of Time-Delay Systems

To achieve asymptotic stability, dissipative and exponential

dissipative concepts are utilised. The connection between a linear dynamical system and a time generator with a practically infinite lag time Both quadratic supply rates and a retention function with an integrated element comparable to the Lyapunov-Krasiovskii integral term are exhibited by the time delay operators. In order to replicate the original time delay dynamical system, a well-known required condition for linear dynamical system is derived from this conclusion. Time delay operators' dissipativity features are used to devise an approach to the construction of Lyapunov-Krasovskii functionals. Finally, discrete-time systems show similar results.

1.3 Main Concepts

Electricians, mechanics, and other engineers must be able to use nonlinear analytic techniques to analyse and develop nonlinear dynamical systems. Despite the fact that these techniques have come a long way since the mid-1990s, nonlinear control remains a difficult task. We will give fundamental findings for nonlinear system analysis, highlighting the differences from linear systems, and we will explain the most significant nonlinear feedback control techniques with the objective of providing an overview of the primary options accessible. In addition, the lectures will attempt to provide context for the usage of each of these technologies.

2 REVIEW OF LITERATURE

Jerzy Klamka et. al. [1] presented Discrete nonlinear finite-dimensional discrete 1D and 2D control systems with constant coefficients are studied in order to answer issues about local restricted controllability. The mapping theorems of nonlinear functional analysis and linear approximation methods are used to create and establish these required conditions for restricted controllability Controllability requirements for unconstrained discrete systems with restricted controls are therefore expanded to cover both 1-D and 2-D discrete systems with restricted controls.

Arash Hassibi et. al. [2] in this paper events" that occur asynchronously drive dynamical systems. Even though the duration of the time period T is infinite, the event rates are regarded to be limited or at Through technical advances in digital and communication systems, they are becoming more and more important to the control sector. These include asynchronous control systems, distributed control systems, and parallelized numerical methods. a queuing system, and a Researchers at the

University of California, Los Angeles have developed an advanced Lyapunov-based theory for dynamical systems that may be controlled by solving problems of bilinear matrix inequality (BMI) or linear matrix inequality (LMI). The method's efficacy is demonstrated through examples.

3 STEERING CONTROL OF SEMI-LINEAR DISCRETE DYNAMICAL SYSTEM

3.1 Introduction

$$x(t+1) = A(t)x(i) + B(t)u(t) + f\big(t, x(t)\big), x(0) = x_0, t \in N_0 \qquad (3.1.1)$$

and its linear system:

$$x(t+1) = A(t)x(t) + B(t)u(t), x(0) = x_0, t \in N_0 \qquad (3.1.2)$$

Here, $(A(t))_{t\in N_0}$ and $(B(t))_{t\in N_0}$ are series of series $n \times n$ and $n \times m$ matrices, correspondingly, and $(x(t))_{t\in N_0}$ and $(u(t))_{t\in N_0 0}$ are series of control vectors in R^m, and state vectors in R^n correspondingly, $f(.,.): N_0 \times R^n \to R^n$ with regard to the second input, a nonlinear function that satisfies the Lipschitz

It is shown that under specific conditions, we can steer any beginning state x_0 of system (3.1.1) to the preferred outcome desired x_1 in N∈N_0 time steps.

4 CONTROLLABILITY OF LINEAR VOLTERRA SYSTEM

4.1 Controllability Using Controllability Grammian

A generic dissimilarity system of the appearance x(t+1)=f(x(t),u(t)) was investigated by Krabs.

In addition, they have developed a linear system regulator that guides a specified beginning condition to a preferred concluding state (3.1.2). A semi-linear difference equation system of the type is examined in this chapter.

Using controllability Grammian, we establish that the linear Volterra system is controllable.

Theorem 4.1

$(A(t))_{t\in N_0}$ and $(B(t))_{t\in N_0}$ are real-time $n \times n$ and $n \times m$ matrix sequences, respectively. Let L be the operator distinct as follow: Suppose that L is the operator, defined as follows (4-1).

This means that these two sentences have the same effect

1. A non-autonomous Volterra system can be regulated by [0, N] (4.1).
2. range $L = R^n$.
3. range $(LL^*) = R^n$.
4. det W $(0, N) \neq 0$, the Controllability Grammian is W, and (4-1.8).

Proof. There is a solution to the system (4.1) by

$$x(t) = Q_t x_0 + \sum_{i=0}^{t-1} Q_i B(t-i-1)\, u(t-i-1)$$

5 STABILITY USING (SP) MATRIX

5.1 Importance of (SP) Matrix

Null solutions to nonlinear non-autonomous discrete dynamical systems exhibit exponential stability in this chapter.

$$x(t+1) = g\big(t, x(t)\big), t \in N_0 \qquad (5.1)$$

Where $g: N_0 \times \Omega \to \Omega,\ \Omega \subset R^n$(sp) matrix proposed by Xue and Guo [63] gives a continuous nonlinear function fulfilling $g(t,0) = 0 \forall t \in N_0$For example, let us just look at

$$g\big(t, x(t)\big) = Ax(t) + f\big(t, x(t)\big)$$

Where

$x(t) \in \Omega, \mathrm{A} \in s = \{A = (a_{ij})_{n\times n} : a_{ij} \geq 0, \sum_{j=1}^{n} a_{ij} \leq 1, \forall i = 1,2,\dots,n\}$ is a (sp) matrix, and the function $f: N_0 \times \Omega \to \Omega$ satisfies the inequality

$$\| f\big(t, x(t)\big) \| \leq a(t) \| x(t) \|, t \in N_0$$

Where $\Sigma a(t)$ is a convergent sequence of positive integers. For example, we may show that the system's null solution is exponentially

Well-known reality: The zero-point solution is exponentially stable as long as the jacobian Dg-(0) of system (5.1) has a severely lower spectral radius than 1. The Eigenvalues of the jacobian must be computed in order to verify this requirement.

A simple procedure provided in the definition of a (sp) matrix may be used to determine if a matrix is (sp). Since the eigenvalues of the Jacobian are not evaluated, the approach presented in this work is extremely efficient for numerical calculations. It was recently reported by Xue and Guo [63] that asymptotic stability of a nu

$$x(t+1) = Ax(t)\ \ t \in N_0 \qquad (5.1)$$

Only when A £ is a (sp) matrix can the zero solution of linear system (5.1.) be asymptotically stable, as shown in Section 2.6.3 and Theorem 2.6.6. It's a disturbance because of (5.1). (5.1). When the nonlinear function is restricted appropriately, it is possible to establish that the perturbed system's null solution (5.1) is exponentially stable

6 OPTIMAL CONTROL OF DISCRETE VOLTERRA SYSTEM - A CLASSICAL APPROACH

In this chapter, the standard minimization approach of Lagrange multipliers is used to study the optimum control issue given by discrete-time linear Volterra systems.

6.1 Introduction

Numerous researchers have focused on the optimum control issue for discrete Volterra systems. To investigate linear-quadratic optimization, Gaishun and Dymkov utilised an operator technique to analyse the response control concerns for linear discrete Volterra systems, Belbas and Schmidt examined the optimum management of a Volterra integral equation with impulse components. The following linear Volterra system is optimally controlled by using a method of Lagrangian multipliers, a standard minimization technique.

$$x(t+1) = \sum_{i=0}^{t} A(i)x(t-i) + Bu(t), t \in N_0$$

REFERENCES

1. Klamka, J., Constrained controllability of nonlinear systems, IMA J. Math. Contr. Inf., Vol. 12, No. 2, pp. 245-252 (1995).
2. Klamka, J., Controllability of Second-Order Semi-linear Infinite Dimensional Dynamical Systems, Applied Mathematics and Computer Science, Vol.8, pp.459- 470 (1998).
3. Klamka, J., Schauder's fixed-point theorem in nonlinear controllability problems, Control and Cybernetics, Vol. 29, pp. 153-165 (2000).
4. Klamka J., Controllability of Nonlinear Discrete Systems, Int. J.Appl.Math. Comput.Sci., Vol. 12, No. 2, pp. 173-180 (2000).
5. L. Chen and K. Narendra, Identification and Control of a Nonlinear Discrete- Time System Based on its Linearization: A Unified Framework, IEEE Transactions on Neural Networks, Vol. 15, No. 3, May (2004).
6. L.J. Corwin and R.H. Szczarba, Multivariable Caculus New York: Marcel Dekker, 1982.
7. Limaye, B.V., Functional Analysis Wiley Eastern Limited, New Delhi, 1980.
8. Mohan C. Joshi, Ramendra K. Bose Some Topics in Nonlinear Functional Analysis, Wiley Eastern Limited, 1985.
9. M. Pinto., Discrete Dichotomies, Computers Math. Applic. Vol. 28, No. 1-3, pp. 259-270 (1994).
10. M. Pinto, Null Solutions of Difference Systems under Vanishing Perturbation, J. of difference equations and Applications, Vol. 9(1), pp. 1-13 (2003).
11. M.N. Islam and Y.N. Raffoul, Exponential Stability in Non-linear Difference Equations, J. of difference equations and Applications, Vol. 9, No.9, pp. 819-825 (2003).
12. M.R. Crisci, V.B. Kolmanovski and A. Vecchio, Boundedness of discrete Volterra equations, J. Math. Anal. Appl., 211, pp. 106-130 (1997).
13. Naulin R., Vanegas C.J., Instability of discrete systems, Electronic J. of differential equations, Vol. 1998, No. 33, pp. 1-11 (1998).

14. P. Eloe, M. Islam, Y. Raffoul, Uniform asymptotic stability in nonlinear Volterra discrete systems, Comput. Math. Appl. 45, pp. 1033-1039 (2003).
15. R.K. George, T.P. Shah, Asymptotic Stability of Nonlinear Discrete Dynamical Systems Involving (sp) matrix, (to appear in Nonlinear Studies).
16. Raju K. George, Trupti P. Shah, Steering Control of Semi-linear Discrete Dynamical System, Journal of the Indian Institute of Science, vol. 87, No. 4, pp.485-489 (2007).
17. Raju K. George, Trupti P. Shah, Accurate solution estimate and Asymptotic behavior of Nonlinear Discrete System, (to be communicated).
18. Mohammadreza Doostmohammadian, "arXiv: 1911.11388v1 [eess.SY] 26 Nov 2019.
19. Thiagop. Chagas, Pierre-Alexandrebliman, Karlh. Kienitz, "Stabilization of Periodic Orbits of Discrete-Timedynamical Systems Using The Prediction-Based Control: New Control Law And Practical Aspects", Journal of the Franklin Institute 355 (2018) 4771–4793.
20. Akbar Zada, Luqman Alam, Poom Kumam, Wiyada Kumam, Gohar Ali, and Jehad Alzabut, "Controllability of Impulsive NonLinear Delay Dynamic Systems on Time Scale", IEEE Access Volume 8, 2020.
21. Jiale Sheng, Wei Jiang, Denghao Pang and Sen Wang, "Controllability of Nonlinear Fractional Dynamical Systems with a Mittag–Leffler Kernel", Mathematics 2020, 8, 2139; doi: 10.3390/math8122139.
22. Sy-Miin Chow, "Practical Tools and Guidelines for Exploring and Fitting Linear and Nonlinear Dynamical Systems Models", Multivariate Behav Res. 2019; 54(5): 690–718. doi:10.1080/00273171.2019.1566050.
23. B. Sundara Vadivoo, Raja Ramachandran, Jinde Cao, Hai Zhang, and Xiaodi Li, "Controllability Analysis of Nonlinear Neutral-type Fractional-order Differential Systems with State Delay and Impulsive Effects", International Journal of Control, Automation and Systems 16(2) (2018) 659-669.

CONCEPTUAL RESEARCH BASED ON HYBRID HYDROGEL NETWORKS FROM POLY ACRYLAMIDE-CO-ACRYLAMIDO GLYCOLIC ACID

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Abstract- Hybrid hydrogel networks synthesized by the simple free radical polymerization of acrylamide, acrylamidoglycolic acid and cloisite sodium clay. To synthesize these hybrid hydrogels N, N'-methylenebisacrylamide used as a cross linker and ammonium peroxydisulphate used as an initiator. The structural characterization of this poly (acrylamide-co-acrylamidoglycolic acid/cloisite hybrid hydrogels (PAAGC), were done using Fourier transform infrared spectroscopy. The resulting hybrid networks was used as an adsorbent for studying the effectiveness in the removal of methylene blue (MB), which is having a wide range of use in different fields such as biology and chemistry. The effects of contact time, initial sorbate concentration, pH, and dose of adsorbent were studied to optimize the adsorption capacity. The batch sorption technique employed, revealed a maximum adsorption. Adsorption isotherms and Kinetic models were fitted to know the adsorption mechanism. This Hybrid hydrogels exhibited excellent performance in MB adsorption. The investigations demonstrated that the PAAGC can be based as an efficient adsorbent for the removal of MB from aqueous solution.

Keywords: Acrylamidoglycolic acid, Cloisite clay, hybrid hydrogels.

1. INTRODUCTION

Most of the environmental problems have their solutions from the environment which are identified through research. Clays are among the cheapest, abundant, environmentally friendly, ion exchangeable adsorbents which can be used to substitute the expensive commercial activated carbon and also non-toxic when compare to pier which can substantially produce environmental pollution problems. [1]

Recent results have found simplest and effective methods with easy operational conditions for the treatment of aqueous textile effluents [2,3]. In general the clays are either used in their natural state or by modification of clays by different processes such as

calcinations, acid activation, pillaring, anion and cation exchange, organic modification with polymers or molecules and so on before usage [1].

In the past, various attempts have been made to develop effective treatment technologies for dye bearing wastewaters, but no single solution has been found to be satisfactory. Different physicochemical processes like adsorption, electro-kinetic coagulation, ion-exchange, membrane filtration, electrochemical oxidation, and photo-catalytic degradation processes have been attempted in treating these wastewaters [4].

Each technique has its own limitations such as generation of secondary effluent, hazardous intermediate products and slow rates of degradation. Thus, it is need of time to research into cleaner techniques for the effective removal of dyes from the effluent stream. Conventional treatment processes such as biological degradation, coagulation, chemical oxidation, ion exchange, and photo degradation are often unable to remove certain textile dyes from effluents because of its high solubility and low biodegradability [5].

However, adsorption has been recognized as a conventional process for the removal of dyes from effluents. Keeping all these in mind, authors synthesized the poly (acrylamide-co-acrylamidoglycolic acid)/cloisite sodium nano-composite hydro gels (PAAGC) for adsorption of Methylene Blue (MB) from aqueous solution. Swelling characteristics of PAAGC were performed in aqueous environment at ambient temperature.

2. EXPERIMENTAL

2.1. Materials

Analytical Reagent grade samples of acrylamidoglycolic acid (AGA) purchased from Aldrich Chemicals Co. Ltd., USA, acrylamide (Am), Cloisite Clay, Methylene blue were purchased from Merck specialties Pvt. Ltd, Mumbai, India. Chemicals were used without further purification and double distilled (DD) water was used throughout the experiments.

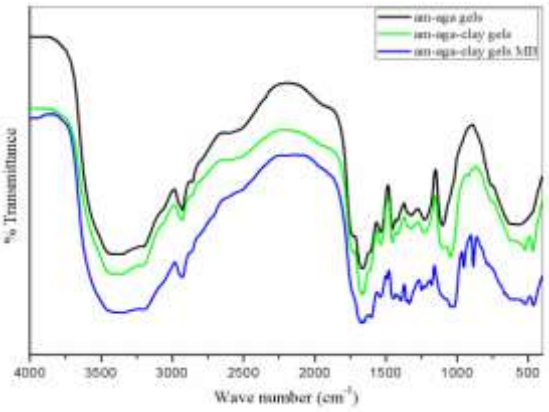

Figure 1 FTIR spectra of PAAGC hydrogels.

2.2. Preparation of Hybrid Hydrogels

PAAGC hydrogels were synthesized by employing free radical polymerization using N, N-methylene bis acrylamide (MBA) as a cross-linker and ammonium

persulfate (APS) as free radical initiator. In detail, PAAGC hydrogels were prepared by first mixing (1g) acrylamide (Am) 1.1417g of acrylamidoglycolicacid (AGA) and 0.214g of Cloisite clay in 5mL water. Another set of hydrogels were synthesized without clay.

The hydrogels were removed, and kept in double distilled water (DD water) by changing DD water until all unreacted monomers removed from the gels, these gels were dried first at room temperature and finally in hot air oven. These dried gels were characterized by FTIR and XRD, studied swelling properties and dye adsorption studies.

3. RESULTS AND DISCUSSION

3.1. Characterization

Fourier transform infrared spectroscopy (FTIR) spectral measurements of pure hydrogels, PAAGC hydrogels and methylene blue loaded PAAGC hydrogels were performed using Perkin Elmer (model spectrum two, England (UK)) spectrophotometer. The PAAGC hydrogels were finely grounded with KBr to prepare the pellets under a hydraulic pressure of 600 dynes/m^2 and spectra were scanned between 4000 to 400cm^{-1}. FTIR spectra of PAAGC are reported in Figure 1.

The strong peak around 3449 cm^{-1} due to the stretching vibration of -OH or NH_2 group, peaks at 1658, 1673 cm^{-1} belongs to amide (C=O, N-H) stretching and 1612 cm^{-1} and 1390 cm^{-1} belongs to COOH asymmetric and symmetric stretching, in addition, the bands around 1310cm^{-1}, 1160 cm^{-1}, 1090cm^{-1}, 990 cm^{-1} and 2900cm^{-1} are attributed to polymer skeleton (C-O, C-C, -CH stretching and bending vibrations) of PAAGC hydro gels.

In clay gels FTIR spectrum in addition to above distinctive peaks at 3450 and 950cm^{-1} which represents Si-OH stretching vibrations. The peaks at 1080, 800, 561 and 455cm^{-1} belong to Si-O-Si, Si-O and O-Si-O vibrations respectively. Where as in methylene blue adsorbed hydro gels significant change is observed in amide, carboxylic and silicate bands shows MB is chemisorbed into the PAAGC hydro gels.

3.2. Static Adsorption Studies

The adsorption studies of the MB on the PAAGC hydro gels were carried out by batch experiments studies.

3.3. Effect of pH

The effect of pH on adsorption capacity was conducted by mixing 0.02gm PAAGC adsorbents with 30 mL of 400 ppm aqueous solution with different pH value ranging from 3-10 static condition for 24h water bath, and then the residual MB concentrations were determined. The effect of pH on

adsorption of MB on PAAGC hydro gels is shown in figure 2.

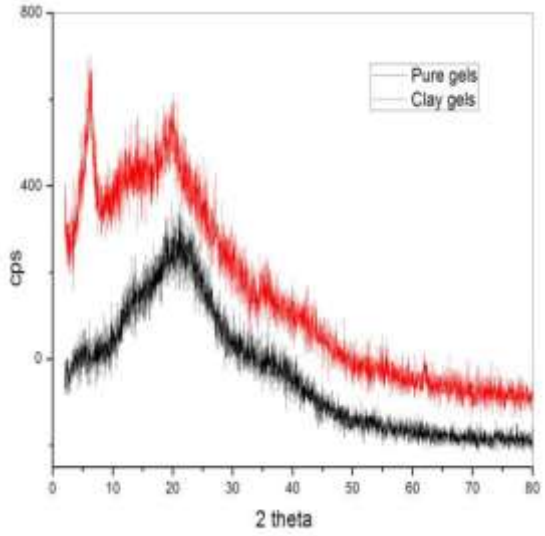

Figure 2 XRD of PAAGC hydrogels.

3.4. Adsorption Kinetics

Adsorption dynamics is used to describe the solute uptake rate which controls the residence time of adsorb ate to uptake the molecules at the solid-solution interface. The effect of time on equilibrium adsorption of PAAGC hydro gels is reported in figure (5a). Two kinetics models were used to analyze adsorption kinetics, namely, pseudo-first order, pseudo-second order. The pseudo first-order, pseudo-second order models are presented by the following equations.

$$\log(C_e - Q_t) = \log C_e - \frac{K_1}{2.303} t$$

The kinetic parameters for adsorption of methylene blue by PAAGC based hydro gels are given in graphs. Based on the obtained correlation coefficients (r2),

4. CONCLUSION

Synthesized PAAGC hydro gels. Characterized with FTIR, based on FTIR studies hydro gel structure is predicted. The peaks in the metal loaded gel IR spectra shows that metal ions are bound to hydro gels. Swelling studies and methylene blue adsorption studies performed; maximum adsorption achieved is 560mg/g of PAAGC hydro-gels.

Table 1 Isotherm model constants for adsorption of MB by PAAGC hydro gels

Langmuir isotherm constants		
K_L	Q_{max}	R^2
$3.53x10^8$	530 mg/g	0.972
Freundlich isotherm constants		
K_f	n	r^2
812.83	0.9	0.955

REFERENCES

1. M. Auta, B.H. Hameed, (2012) Modified mesoporous clay adsorbent for adsorption isotherm and kinetics of methylene blue, Chemical Engineering Journal 198-199, 219-227.
2. A. Xue, S. Zhou, Y. Zhao, X. Lu, P. Han (2010) Adsorption of reactive dyes from aqueous solution by silylated palygorskite, Applied Clay Science, 48, 638-640.
3. V. Vimonsesa, B. Jina, C.W.K. Chow, C. Saint, (2010) Development of a pilot fluidized bed reactor system with a formulated clay–lime mixture for continuous removal of chemical pollutants from wastewater, Chemical Engineering Journal, 158, 535–541.
4. S. R. Shirsath, A. P. Patil, R. Patil, J. B. Naik, P. R. Gogate, S. H. Sonawane, (2013) Removal of

Brilliant green from wastewater using conventional and ultrasonically prepared Poly(acrylic acid) hydrogel loaded with Kaolin clay: A comparative study, - Sono-chemistry, 20, (3) 914-923.

5. V. Janaki, K. Vijayaraghavan, A.K. Ramasamy, Kui-Jae Lee, Byung-Taek Oh, Seralathan Kamala-Kannan, (2012) Competitive adsorption of Reactive Orange 16 and Reactive Brilliant Blue R on polyaniline/bacterial extracellular polysaccharides composite-A novel eco-friendly polymer, Journal of Hazardous Materials, 241- 242, 110- 117.
6. Seema Monika Datta, (2013), Clay–polymer nano-composites as a novel drug carrier: Synthesis, characterization and controlled release study of Propranolol Hydrochloride, Applied Clay Science, 80-81, 85-92.

SOCIO-PRAGMATIC STUDY BASED ON TEACHERS IN HIGHER EDUCATION

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1 INTRODUCTION

Ever since the recognition of Pragmatics as a main subject of inquiry in mainstream language research, many Foreign Language Teaching curricula have adopted it as an important constituent for a more communicative language teaching objective. Despite such a credit, the pragmatic dimension has largely been underrepresented and is scarce in Foreign Language Classrooms in Odisha though with the latest Bachelor's, Master's and Doctorate degrees reforms, it has been included as an independent module in different Language Sciences' programs.

The problem is that the nature of Pragmatics requires a more "pragmatic" implementation, i.e., in addition to knowledge about the different politeness strategies, speech acts and conversational routines provided by the Pragmatics module, offering students the opportunity to practice it seems to be indispensable for a more developed pragmatic competence. And since time allotted to the module is barely enough to cover the theoretical aspect of the subject, setting pragmatic competence as an objective for the productive skill modules(written and oral) would put theory into practice and offer more opportunities for students to develop their pragmatic ability.

Over the past few years, important strides have been made toward recognizing the development of pragmatic competence as a less peripheral component of foreign Language proficiency. Current research questions have extended beyond the confines of how important is integrating pragmatics in Language syllabi to addressing issues like what strategies, techniques and kind(s) of instruction should be implemented for a more sustained pragmatic competence. The contribution of the present paper is threefold; first, revisiting the different Pragmatics developmental models that proved thriving and productive in Foreign Language contexts.

Second, reviewing students' perception of the place the pragmatic objective holds in their oral and written courses syllabi and, finally, making a case for a more pragmatics-oriented language teaching at the university level, not only by an explicit instructed learning but by situating pragmatics at the heart of Foreign Language Teaching.

1.1. Pragmatic Competence and Fl Advanced Learners

Because of a conspicuous lack of longitudinal studies in the field, not much is known about the order of acquisition in pragmatic development. While a minimal level of grammatical competence is necessary for pragmatic competence development, high levels of grammatical competence do not ensure equally high levels of pragmatic competence. Interestingly enough, both are not contradictory.

In other words, linguistic competence is necessary but not sufficient as a platform for FL pragmatic competence development. So the acquisition of L2linguistic competence generally precedes the acquisition of the L2 socio-cultural rules needed to decide which form to map onto which function in which context.

1.2 Pedagogical Framework for Fl Pragmatic Development

As it has been attested to by numerous investigations the greater the distance between cultures, the greater the difference is in the realization of the pragmatic principles governing interpersonal interaction. And in these cases, more than others, instruction in pragmatics is necessary so that without some form of instruction, many aspects of pragmatic competence do not develop sufficiently. The lack of sufficient pragmatic instruction is a leading cause to run the speakers towards the risk of appearing uncooperative at the least, or, more seriously, rude or insulting.

This is particularly true of advanced learners whose high linguistic proficiency leads other speakers to expect concomitantly high pragmatic competence. Following this line of reasoning, a fair amount of classroom activities was suggested to facilitate the development of learners' pragmatic competence with respect to understanding and performing communicative action in foreign language contexts. So Communicative action comprises not only speech acts such as complaining, apologizing, or refusing, but also dynamic participation in conversation, engaging in different types of oral or written discourse, and maintaining interaction in complex speech events.

2 LITERATURE REVIEW

Pragmatic competence, for the purpose of the present study, refers to "pragmatic ability" as emphasized by Savignon (1972), rather than the broader "pragmatic competence" as defined by Hymes (1972), Widdowson (1983), Canale (1983), and Canale and Swain (1980) who equates "competence" with "Knowledge". According to Saving on (1972), communicative competence is "the ability to function in a truly communicative setting –that is, in a dynamic exchange in which competence must adapt itself to the total informational input, both linguistic and paralinguistic, of one or more interlocutors" (p.8).

According to her, the nature of communicative competence is more interpersonal than intrapersonal and relative rather than absolute, and it is this definition to be adopted throughout this study. In spite of the agreement that pragmatic competence is one of the vital components of communicative competence (Bachman1990, Bachman and Palmer 1996), there is a lack of a widely accepted definition of the term. According to Bachmann's model (1990), Pragmatic Competence is subdivided into illocutionary competence (knowledge of speech acts and speech functions) and sociolinguistic competence, which entails the ability to use language appropriately according to different contexts.

Another definition to pragmatic competence, offered by Kasper (1997), is "knowledge of communicative action and how to carry it out" (illocutionary competence) and the "ability to use language appropriately according to context"(sociolinguistic competence).As reported by Roohani and Mirzei (2012), Pragmatic competence could also be defined as "the ability to use language appropriately in a social context", and this involves both "innate and learned capacities and develops naturally through a socialization process" (Taguchi, 2009)Another attempt to define the term is offered by Dippold (2007) [5] who describes it as "knowledge of forms and strategies to convey particular illocutions (i.e. pragmalinguistic competence) and knowledge of the use of these forms and strategies in an appropriate context i.e. socio-pragmatic.

Thus, in order to be pragmatically competent, it is widely agreed that learners must map their socio-pragmatic knowledge on pragma-linguistic forms and strategies and be able to use their knowledge online under the constraints of a communicative situation (McNamara & Roever, 2006; Roever, 2004) [14]. Austin (1998) [1] calls equally for a "need to acquire pragmatic knowledge in

a holistic context, encompassing all the discrete components of pragmatic ability, including discourse management ability and, most importantly, culture". (P. 326).

However, some other researchers (Blum Kulka,1990; Muller, 1981; and Wirzbicka,1994) have not only proved convincingly that there is a need for instruction to focus on the Pragmatics of the FL, but also demonstrated that the absence of instruction could result in other linguistic problems ranging from the L1 Schematic transfer (which, according to House (1993) stems primarily from a lack of the culture-specific pragmatic knowledge needed for a given situation) to a total divergence from their native culture (Giles, Coupland, & Coupland, 1991) [7]. Blum Kulka (1990) proposed what she termed the "General Pragmatic Knowledge Model", where the learner is presented with an organized schema containing all the target language linguistic forms used for a specific speech event.

This schema is governed by a "cultural filter" which decides the situational appropriateness of the realization of the linguistic forms. She argues that this type of instruction is necessary because the main obstacle to learners' exploiting their general pragmatic knowledge base appears to be their restricted FL linguistic knowledge or difficulty in accessing it smoothly. In addition to acquiring processing control over their already existing pragmatic foundations, adult L2 or FL learners need to develop new representations of pragma-linguistic and socio pragmatic knowledge not existing in their L1 (Bialystok, 1993).

A similar model called the "cultural script" was suggested by Wierzbicka (1994), which she defines as "a specific type of schema which captures characteristic L2cultural beliefs and values in order for learners to understand a society's ways of speaking" (p. 2). Capturing L2 beliefs and values according to Wierzbicka includes input exposure to pragmatic realizations, discussions of the meta-pragmatic knowledge underlying communicative action, and engagement in communicative activities where learners can practice using the linguistic knowledge they have acquired. Muller's (1981) which is an interpretive strategy emphasizing the importance of prior knowledge for acquiring pragmatic competence, is a combination between assimilation and spot-the-difference strategy whereby the FL Learner is helped to situate FL communicative practices in their socio-cultural context and appreciate their meanings and

functions within the FL community.

3 RATIONALE OF THE STUDY

One issue, which has long been debated, is whether language learners need assistance in order to develop a second or foreign language pragmatic competence. In other words, to study whether pragmatic competence simply develops alongside lexical and grammatical knowledge, or it requires a pedagogical intervention. Since the deciding factor that underlies pragmatic ability is culture, and culture is a subconscious system, then it is difficult, not to say impossible, to make it teachable. When talking about the possibility of developing pragmatic competence in a second or foreign language, it is more appropriate to address the issue of how to arrange learning opportunities in such a way that they benefit the development of pragmatic competence.

4 POPULATION AND SAMPLE

In order to discover what students had retained from the module of pragmatics and whether they were offered opportunities to use this knowledge in the oral/written modules, the questionnaire was submitted to120 University students of different universities of Odisha, representing thus 23,64% of the entire population. The sampling technique used to select the survey subjects is random sampling technique, i.e. without taking into consideration any parameter other than their "availability" and cooperation.

4.1 Questionnaire Description

The questionnaire (attached as appendix A) comprises nineteen items, grouped into four major categories according to the aim of each set of questions: Questions about Pragmatic Knowledge/use, Questions about the Oral Expression Module, Questions about the Written Expression Module, and a Question about coordinating objectives. The questionnaire in its whole comprises two open ended questions, thirteen closed questions, one liker-scale question, and the remaining three are 15 multiple choice questions. Sometimes one question is asked (differently) in more than one section in order to test the validity of the answers. Overly long questions, double-barreled and leading questions were avoided.

5 ANALYSIS AND DISCUSSION

Following the responses of the participants to the questionnaire, it is noted that all the students (100%) are aware of the importance of the pragmatic module in their curriculum; they claimed that it helped them broaden their knowledge about the English language, mainly matters

related to the cultural traits differentiating the English language and Odia (85.71%) while performing different speech routines. However, the majority (81.90%) of the respondents claimed that, outside the pragmatics class, they are not offered opportunities to practice this knowledge.

Concerning the productive skills modules(oral and written expression), all students reported that oral expression activities range from book reviews presentations to exposes discussions, while written expression activities vary between “writing short stories and plays” (about 38.09%) and discussing assigned literary works (61.90%), and although this discussion might be perceived as “offering opportunities to practice written communicative ability” (5.6%), that is not the case, as argued by some researchers who suggest that if the FL learner is not consciously targeting a specific pragmatic aspect, the learner will not develop competence.

5.1 Findings

Empirically speaking, it is widely observed that many students do have a considerable amount of pragmatic knowledge (thanks to the pragmatics module and / or a supposedly sufficient exposure to the target culture), but these students don’t always make good use of it. They either negatively transfer their L1 pragmatic routines into the target language or, in some cases, they totally converge to the target culture. Thus, there is a clear role for a pedagogical intervention.

5.2 Suggestions Awareness-Raising Activities:

Students should acquire both socio-pragmatic and pragma linguistic information. These activities are based primarily on observation of particular pragmatic features in various sources of oral or written data, ranging from native speaker 'classroom guests' to videos of authentic interaction, feature films, and other written and audiovisual sources. Students can also be given a variety of observation assignments outside the classroom. Depending on what aspects these tasks focus on, observation tasks can be classified into socio-pragmatic or pragma-linguistic tasks.

REFERENCES

1. Austin T. Cross-cultural pragmatics building in analysis of communication across cultures and languages: Examples from Japanese Foreign Language Annals, 1998; 31:326- 346.
2. Bardovi-Harlig K. Exploring the Inter language of Inter language pragmatics: A Research Agenda for Acquisitioned Pragmatics. Language learning, 1999; 49:677-713.
3. Blum-Kulka S, House J, Kasper G. Investigating Cross-cultural

Pragmatics: An introductory overview Cited in Blum-Kulka, House & Kasper (Eds). Cross Cultural Pragmatics: Requests and Apologies, 1-34. New Jersey: Ablex Publishing Corporation, 1989. 17

4. Bouton LF A cross-cultural study of ability to interpret implicatures in English. World English's 1988; 7(2):183- 196.
5. Dippold D. Using Speech Frames to Research Inter language Pragmatics: Face work Strategies in L2 German Argument Journal of Applied Linguistics 2007; 4(3):285-308.
6. Ellis R. Second Langage Acquisition. Oxford: Oxford University Press, 1997.
7. Giles H, Coupland N, Coupland J. Accommodation Theory: Communication, Context and Consequence University of Arizona Library, 1991.
8. Ishihara N, Cohen AD Teaching and Learning Pragmatics Longman Applied Linguistics, 2010.
9. Kasper G, Blum Kulka S. Inter language Pragmatics, 64- 81. Oxford: Oxford University Press, 1993.
10. Kasper G, Schmidt R. Developmental Issues in Inter language Pragmatics Studies in second language acquisition 1996; 18:149-169.
11. Kasper G. (Can pragmatic competence be taught? Honolulu: University of Hawaii, Second Language Teaching & Curriculum Center, 1997a.
12. Kasper G. Four perspectives on L2pragmatic development, Honolulu: University of Hawaii, Second Language Teaching & Curriculum Center, 2000.
13. Kasper G, Rose K. Pragmatic Development in a Second Language Blackwell publishing, Inc, 2002.
14. McNamara T, Roever C. Language Testing: The social Dimension. Malden, MA: Blackwell Publishing, 2006.
15. 15 Nunan D Designing Tasks for the Communicative Classroom Cambridge Language Teaching Library, 1989.
16. Roohani A, Mirzaei A. Exploring Pragmalinguistic and Socio pragmatic Variability in Speech Act Production of L2 Learners and Native Speakers. The Journal of Teaching Language Skills (JTLS) 2012; 4(3):79-102.
17. Savignon S. Communicative Competence: State of the Art. TESOL Quarterly, 1991; 25(2):261-277.
18. Taguchi N. (ed.) Pragmatic competence in Japanese as a second/foreign language. Berlin/New York: Mouton de Gruyter, 2009.
19. Takahashi, S. Pragmatic Transferability. Studies in Second Language Acquisition, 1996; 18:189-223. 20. Wierzbicka A, Goddard C. Cultural Scripts: What are they and what are they good for? Intercultural Pragmatics 2004; 1-2:153-166. 21. Yule G. Pragmatics. Oxford: Oxford University Press. 1996.

RECENT STUDY FOR ATTITUDES AND EXPERIENCES OF YOUTH FOR ROMANTIC RELATIONSHIPS

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Abstract:
Introduction: youthful populace today will be undergoing a few transformations; the possibilities of getting included with inverse sex partners expand on an extensive degree especially clinched alongside urban parts of the nation over.
Objectives: to inspect the attitudes recognitions for childhood for India regarding sentimental associations and physical closeness.
Methodology: those display consider utilized those information from those "Youth in India: circumstances Also Needs" review directed throughout 2006-2007. This contemplates secured six states to be specific Andhra Pradesh, Bihar, Jharkhand, Maharashtra, Rajasthan and tamilnadu.
Results: this ponder found that lion's share (nearly you quit offering on that one fourth) of the youngsters went through run through for companions from claiming inverse sex.
Conclusions: Attitudes, recognitions encounters from claiming adolescent in regards sentimental connections physical closeness would dead set by the amount for foundation aspects similar to age, sex, spot from claiming residence, religion, caste, training and so forth.
Keywords: Pre-marital sex, Youth, Romantic relationship, Risk behavior, Rural-urban differential.

1. INTRODUCTION

That adolescent populace on India in the age class 15-34 A long times may be needed on increment starting with 335 million on 2001 should 464 million to 2021. Adolescent populace comprises 35 percent for urban populace 32 percent about provincial number. Youthful populace today will be undergoing a few transformations. Nothing lifestyle around those adolescent is clinched alongside expanding pattern. Thus, chance of Hosting end contacts for inverse sex companions expanded which might prompt that contribution in the pre-marital sex, especially on urban parts of the nat. An investigation directed "around low-income school people to Mumbai uncovered that 26 percent Also 3 percent about male and female

understudies respectively, were sexually encountered. 1 adolescent sexual practice are likewise impacted Toward companion elements for example, the standards espoused by, and the practices from claiming companions. For example, youngsters who trust that their associates are sexually encountered would less averse over others on make sexually animated. Numerous investigations starting with India propose that more amazing companion acknowledgement about pre-marital sex and expanded recurrence for companion contact would straightforwardly relate with premarital sexual start. 2 Pre-marital sexual starts done right on time ages prompts unwanted teenage pregnancies Also danger from claiming getting STIs.

1.1 Objectives of the Study

1. To examine the attitudes and perceptions of youth in India about romantic relationships.
2. To study the experiences of Indian youth regarding romantic relationships and physical intimacy.

2. DATA SOURCE

The introduce contemplate utilized the information from the "Youth clinched alongside India; circumstance also Needs" review directed throughout 2006-2007. 12 those adolescent consider concentrated ahead hitched unmarried youthful ladies unmarried adolescent men age-old 15-24 quite some time and, due to those lack about wedded adolescent men in the more youthful ages, hitched men age-old 15- 29 years, On both country and urban settings. This investigation secured six states to be specific Andhra Pradesh, Bihar, Jharkhand, Maharashtra, Rajasthan and Tamilnadu.

2.1 Sampling

The investigation approached provincial and urban zones about each state concerning illustration autonomous testing domains and, therefore, drew test zones freely to every from claiming these two domains. In place should keep away from possibility dangers connected with interviewing both ladies Also men starting with the same PSU, we concluded on direct meetings clinched alongside differentiate PSUs for female male respondents, that is, meetings with youthful ladies for 150 PSUs Also junior men in the remaining 150 PSUs. These 150 PSUs were further separated just as under country also urban areas, that is, 75 to country respondents 75 to urban respondents. Inside each inspecting domain, a deliberate multi-stage inspecting configuration might have been embraced. Example determination methods differed to a degree to country and urban areas, Likewise depicted the following.

3. METHODOLOGY

In this study, the concentrate may be looking into attitudes encounters of sentimental connections Also physical closeness. Namely, the long run used for inverse sex friend, at any point kissed each other, and at any point required sexual intercourse with boy/ young lady friend, and period at start about pre-marital sex. In this article, attitudes encounters would sort under here parts-agree, differ Also can't say alternately not indeed. The bi-variant dissection is used to study those attitudes and encounters about sentimental associations and physical closeness from claiming childhood also their foundation qualities. The autonomous variable utilized for the Investigation will be period which need been sorted under two gatherings 15-19 years, 20-24 quite some time. The spot about home comprises for provincial and urban puts. The training of the respondent need been thought seriously about for the Investigation which comprises for no education, primary, secondary, higher optional over. Religion may be separated under three Classes which need aid Hindus, Muslims, also how. Position classifications need aid planned castes, booked tribes, OBCs, also how.

4. RESULTS AND DISCUSSIONS

Duration of the time went through for companions about inverse sex around adolescent need suggestion to their conduct technique. In this study, almost one-fourth for young frequently all the used period with inverse sex companions over 70 percent used “some time”. The individuals who accounted for never investing time with inverse sex companions constitute over 4 percent just. The individuals who went through chance ‘often’ would a greater amount in urban ranges. There may be no huge distinction over religious bunches. Upon what amount of time they use for inverse sex companion need not been required previously, consider.

Some other investigations are additionally discovered comparative effects such as this examine. 13. When required if they at any point kissed each other, about half of the respondents expressed that they were captivated over kissing preceding m. This extent may be much higher around both hitched also un-married guys. If rural-urban distinction is not much, it is somewhat additional around provincial childhood. The reporting weight from claiming continuously captivated over kissing when marriage is higher around rustic regions over urban parts.

5. CONCLUSIONS

Attitudes, recognitions Also encounters about adolescent in regards to sentimental associations and physical closeness are decided Toward An

amount about foundation qualities like age, sex, spot about residence, religion, caste, education, and so forth throughout this way, observing and stock arrangement of all instrumentation may be enhance. Greater part of the youngsters used the long haul for companions for inverse sex, both in provincial urban zones. The individuals who news person similarly as never bring used duration of the time for inverse sex companions will be not many. Around one-fourth for India young news person that they needed sex with boy/ young lady in front of m. However, when enquired regarding those attitudes viewing extra-marital sexual connections to men women, mind-greater part disagreed with those proclamations. It is paramount with state here that should a slight extent, that's only the tip of the iceberg male young suitably with those statements, contrasted with female. Expansive greater part about childhood (both guys and females) required their initially sexual intercourse during a junior agdistis.

REFERENCES

1. Abraham L, Kumar AK. Sexual Experiences and Their Correlates among College Students in Mumbai City, India. International Family Planning Perspectives 1999; 25(3): 139-46.
2. Alexander M, Garda L, Kanade S et al. Correlates of premarital relationships among unmarried youth in Pune district, Maharashtra, India. International Family Planning Perspectives 2007; 33(4): 150-59.
3. Alexander M, Garda L, Kanade S et al. Romance and sex: pre-marital partnership formation among young women and men, Pune district, India. Reproductive Health Matters 2006; 14(28): 144-55.
4. Awasthi S, Pande VK. Sexual behavior patterns and knowledge of sexually transmitted diseases in adolescent boys in urban slums of Lucknow, North India. Indian Pediatrics 1998; 35: 1105-109.
5. Jejeebhoy SJ. Adolescents' sexual and reproductive behaviour: A review of evidence from India. In: Women's Reproductive Health in India. Ramasubban R, Jejeebhoy SJ (Eds.). Jaipur: Rawat Publications, 2000: 40-101.
6. Mehra S, Savithri R, Coutinho L. Sexual behaviour among unmarried adolescents in Delhi, India: Opportunities despite parental controls. Paper presented at the IUSSP Regional Population Conference, Bangkok.
7. Patel V, Andrew G. Gender, sexual abuse and risk behaviours: A study of school based adolescents in Goa. National Medical Journal of India 2001; 14: 263-67.
8. Follingstad D, Bradley R, Laughlin J et al. Risk factors and correlates of dating violence: The relevance of examining frequency severity levels in a college sample. Journal of Violence and Victims 1999; 14: 365-80.
9. Collumbien M, Das B, Bohidar N. Early sexual experience of males in Orissa: Context, partners and differentials. In: Reproductive Health in India: New Evidence. Koenig MA, Jejeebhoy S, Cleland JC et al. (Eds.). Delhi: Rawat Publications, 2008.
10. Sodhi G, Verma M, Pelto PJ. Seeking gratification: a study of sexual

behaviour patterns of adolescents in an urban slum. In: Reproductive health in India: Newevidence. Koenig MA, Jejeebhoy S, Cleland JC et al. (Eds.). Delhi: Rawat Publications, 2008.

11. Smith D, Donnelly J. Adolescent dating violence: A multi-systemic approach of enhancing awareness in educators, parents, and society. Journal of Prevention and Intervention in the Community 2001; 21: 53-64.
12. International Institute for Population Sciences (IIPS) and Population Council. Youth in India: Situations and Needs 2006-07, Mumbai: IIPS. 2008.
13. Abraham L. Bhai-behen, true love, time pass: Friendships and sexual partnerships among youth in an Indian metropolis. Culture, Health & Sexuality 2002; 4: 337-53.
14. Tivvari VK, Kumar A. Premarital Sexuality and Unmet Need of Contraception among Youth-Evidence from two cities of India. J Family Welfare 2004; 50: 62-72.
15. Santhya KG, Acharya R, Jejeebhoy SJ et al. Timing of first sex before marriage and its correlates: evidence from India. Culture, Health & Sexuality2011; 13: 327-41.

CHARACTERISTIC ANALYSIS FOR DIFFERENT ADMIXTURES OF CONCRETE

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Abstract- In this study different type of admixtures (jiggery water, sugar water, starch water) and super plasticizer were used for m30 grade of concrete to improve the properties of fresh and harden Concrete such as increase the workability, increase the compressive strength by adoption super plasticizers, admixtures which increase the workability and hence the strength is increased through the reduction of water content. The experimental work was divided into two phases: 1. Tests on basic materials (cement, aggregate, sand, water) and the effect of recommended dose of admixture on the properties of fresh and hardened concrete. The results of tests for the basic materials were carried to ensure that their results conforming to their standards and can be used. 2. in 2nd phase use admixture and super plasticizers both and obtained standard results.

1. INTRODUCTION

Nowadays, the concrete admixtures are widely utilized in the development projects. the most sorts of chemical admixtures is summarized as plasticizers, accelerating/retarding agents, air entraining agents, waterproofing additives and others like corrosion inhibitors and coloring agents etc. the advantages derived from the utilization of chemical admixtures embody improved durability, strength, chemical resistance, coloring, reduction in water and cement demand and increased operating properties of concrete. Considering these facts, present research work is devoted to the investigations on the effects of natural admixtures on the concrete and artificial super plasticizers. In this work Slump cone test and compression test for different combinations of concrete and natural admixtures. In the research work, natural admixtures used are sugar water, starch water ad jiggery water with 2.5%, 5% and 7.5% concentration. Concrete used was M30 grade, and the synthetic super plasticizers. Following are the objectives of research work.

1) Evaluation of performance of concrete using natural admixtures;

2) Evaluation of performance of natural admixtures with artificial superplaticizers;
3) Ranking of different natural admixtures.

2. LITERATURE REVIEW

Present section is devoted to the contributions of research in the field of concrete and its unconventional additives, the details of which are presented in upcoming sub-sections, followed by investigated gaps in the research work.

2.1 Contributions of Researchers in the field of Admixtures

Following are the contributions of different researchers in the field of admixtures.

1. Plank et al.(2015)

An overview of current PCE compositions and synthesis strategies is provided, followed by novel applications for PCEs together with C–S–H-PCE nano-composites and an outline of still unresolved challenges for PCE technology. In addition, the practicality of chemical admixtures in specific applications for low-carbon cements and concrete systems is mentioned. The action mechanisms of retarders and therefore the utilisation system of sludge water by using retarder are introduced. Moreover, the influence of fluoride ion and also the effectiveness of PCE polymers in blended cements and also the impact of non-adsorbed polymer are given. And also the impact of special interface modifying materials, of a refined pore structure and of chemical admixtures, significantly shrinkage -reducing agents, is delineated. The article concludes that more accurate quantitative micro-analytical strategies and modeling tools are needed to get a holistic understanding of factors affecting the microstructure of concrete, with the ultimate goal of achieving a more durable concrete.

2. Albayrak et al.(2015)

This study was carried out for the purpose of analyzing general utilization and consciousness regarding admixtures through a survey in Eskisehir, Turkey. The survey was performed by 153 construction professionals. The questions on reasons for preference of admixtures, sorts of preferred admixtures and dosage, helpful and adverse effects of admixtures, impacts on cost and considered use of admixtures area unit included within the survey. Varieties of statistical analyses are administrated using SPSS on data obtained. Consistent with results, chemical admixtures are used over 70th of the whole annual concrete production. The initial expectation of the participants within the use of the admixtures is to boost the properties of the recent concrete. to boot, the foremost preferred admixtures are plasticizers. the following sorts of admixtures are

agents moving the setting time of concrete. Though the participants' interest to using chemical admixtures is extremely exceptional, the awareness on this subject is extremely deficient. The similar studies can be suggested to use a lot of comprehensively. Professionals, at any level within the construction sector, got to learn about the accurate consumption of those agents so as to avoid inappropriate results.

3. Alonso et al. (2015)

C3A is the most extremely reactive phase in clinker and also the one with the best affinity for superplasticiser admixtures. The quantity of C3A in cement, the sulfate content in the medium and also the kind and quantity of admixture mostly confirm paste, mortar and concrete rheology. Several unknowns remain, however, around the result of SP structure on admixture adsorption onto (cubic or orthorhombic) C3A polymorphs. Isotherms were found for polycarboxylate ether and naphthalene-based admixture adsorption onto artificial cubic and orthorhombic C3A to work out that result, given their totally different structure and nature. The impact of sulfates on adsorption was conjointly explored. The conclusion drawn was that admixture structure nd sulphate content in the media was the factors with the best impact on adsorption onto isometric C3A. Orthorhombic C3A was determined to react more intensely to the presence of sulphate and consequently to have less affinity for the admixtures. In the presence of soluble sulfates the addition of superplasticisers was shown to retard the looks of the most cubic-C3A calorimetric signal more effectively when admixture-sulfate competition was more intense. The presence of SP admixtures has no impact on the peak heat flow time in orthorhombic-C3A hydration. The affinity of this polymorph for sulfates is thus high that admixture adsorption is much smaller than ascertained in cubic-C3A. Therefore, the SPs have a scant effect on orthorhombic-C3A hydration.

4. Sotiriadis et al.(2013)

Two factors that affect concrete's durability were investigated, as well as the effect of the mineral admixtures used, additionally because the effects of chlorides on concrete's deterioration as a result of the thaumasite kind of sulphate attack. Concrete specimens were prepared with Portland sedimentary rock cement in addition as by replacing a precise quantity of sedimentary rock cement with natural pozzolana, fly ash, blast furnace slag or metakaolin. The specimens were immersed in 2 corrosive solutions (chloride–sulfate; sulfate),and hold on at 5 ± 1 C. Visual scrutiny of the specimens, mass lineaments

and compressive strength tests took place for twenty-four months. The partial replacement of rock cement with mineral admixtures retards and inhibits concrete's deterioration. In the case of rock cement concrete without mineral admix- tures, chlorides mitigate the corrosive result of sulfates. Concerning concrete containing mineral admixtures, the concomitant presence of chlorides amplifies the detrimental effect of sulfates and ends up in a worse level of damage.

5. Wang et al.(2012)

The possibility of using steel slag and coarse blast furnace slag (GBFS) as a alloyed mineral admixture for concrete is investigated. The results show that GBFS can weaken the negative effects of steel slag on the properties of concrete, like decrease of the strength and introduction of harmful pores. The steel slag–GBFS blended mineral admixture containing 30–50% steel slag can enable the mortar to possess a satisfactory strength. Steel slag has a wonderful ability to retard the setting time, decrease hydration heat, and improve the fluidity of concrete scrutiny with GBFS. The mixed mineral admixture composed of 500th steel slag and 50% GBFS is more efficient than fly ash in decreasing the early association heat of binder. Steel slag and GBFS are reciprocally complementary in several properties, and a perfect blended mineral admixture that endows the concrete satisfactory strength, long setting time, low hydration heat, and sensible fluidity is obtained by compounding steel slag and GBFS at proper ratios.

6. Cheung et al.(2011)

In this paper the impact on association of many categories of chemicals is reviewed with a stress on the current understanding of interactions with cement chemistry. These embody setting retarders, accelerators, and water reducing dispersants. The flexibility of the chemicals to change the aluminates–sulfate balance of cementations systems is mentioned with a spotlight on the impact on silicate association. As a key example of this complex interaction, uncommon behavior typically ascertained in systems containing high Ca fly ash is highlighted.

3. EXPERIMENTATION

Present section tells about the test procedures used in the present research work, the details of which are presented in upcoming sections.

3.1 Compressive Test

The compressive strength of hardened cement is the most important of all the properties. Therefore, it is not surprising that the cement is always tested for its

strength at the laboratory before the cement is used in important works. Strength tests are not made on neat cement paste because of difficulties of excessive shrinkage and subsequent cracking of neat cement. Figure 3.1 shows a compressive testing machine.

Figure 3.1 Compressive testing Machine

3.2 Slump Cone Test

The word ―workability‖ or workable concrete signifies much wider and deeper meaning than the other terminology ―consistency‖ often used loosely for workability. Consistency is a general term to indicate the degree of fluidity or the degree of mobility. The factors helping concrete to have more lubricating effect to reduce internal friction for helping easy compaction are given below: (a) Water Content (b) Mix Proportions (c) Size of Aggregates (d) Shape of Aggregates (e) Surface Texture of Aggregate (f) Grading of Aggregate (g) Use of Admixtures.

Slump test is the most commonly used method of measuring consistency of concrete which can be employed either in laboratory or at site of work. It is not a suitable method for very wet or very dry concrete. It does not measure all factors contributing to workability, nor is it always representative of the placability of the concrete.

The pattern of slump is shown in Fig. It indicates the characteristic of concrete in addition to the slump value. If the concrete slumps evenly it is called true slump. If one half of the cone slides down, it is called shear slump. In case of a shear slump, the slump value is measured as the difference in height between the height of the mould and the average value of the subsidence.

4 CONCLUSION

Present research work is based on effect of natural admixtures on the performance of concrete. For this purpose a M30 concrete was prepared in association of different admixtures, Jiggery, Sugar and Starch, and different tests, Slump cone test, Compaction test (with and without artificial plasticizer) and Compression test (7 days, 14 days and 28 days) were performed on the samples along with the sample of M30, and finally rankings of admixtures were carried out. Following are the results obtained.

1. Jiggery scores rank 1 on the different criteria;

2. Sugar scores rank 2 on the different criteria; and
3. Starch scores rank 3 on the different criteria.

REFERENCES

1. Cheung, J., Jeknavorian, A., Roberts, L., & Silva, D. (2011). Impact of admixtures on the hydration kinetics of Portland cement. *Cement and concrete research*, *41*(12), 1289-1309.
2. Sotiriadis, K., Nikolopoulou, E., Tsivilis, S., Pavlou, A., Chaniotakis, E., & Swamy, R. N. (2013). The effect of chlorides on the thaumasite form of sulfate attack of limestone cement concrete containing mineral admixtures at low temperature. *Construction and Building Materials*, *43*, 156-164.
3. Plank, J., Sakai, E., Miao, C. W., Yu, C., & Hong, J. X. (2015). Chemical admixtures—Chemistry, applications and their impact on concrete microstructure and durability. *Cement and Concrete Research*, *78*, 81-99.
4. Alonso, M. M., & Puertas, F. (2015). Adsorption of PCE and PNS superplasticisers on cubic and orthorhombic C3A. Effect of sulfate. *Construction and Building Materials*, *78*, 324-332.
5. Wang, Q., Yan, P., & Mi, G. (2012). Effect of blended steel slag–GBFS mineral admixture on hydration and strength of cement. *Construction and building materials*, *35*, 8-14.
6. Albayrak, G., Canbaz, M., & Albayrak, U. (2015). Statistical analysis of chemical admixtures usage for concrete: a survey of eskisehir city, turkey. *Procedia engineering*, *118*, 1236-1241.

A STUDY BASED ON A CRACKED CONCRETE BEAM

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Abstract - Cracks in vibrating component can initiate catastrophic failures. The presences of cracks change the physical characteristics of a structure which in turn alter its dynamic response characteristics. Therefore there is need to understand dynamics of cracked structures. Crack depth and location are the main parameters for the vibration analysis. So it becomes very important to monitor the changes in the response parameters of the structure to access structural integrity, performance and safety, and to examine the effect of the crack to the natural frequency of beams. In present research work, contributions of researchers in the field of concrete with varying depths are acknowledged and gaps in the research as well as objectives of new research are proposed.
Keywords: Concrete, crack depth, location.

1 INTRODUCTION

The most common structural defect is the existence of a crack. Cracks are present in structures due to various reasons. The presence of a crack could not only cause a local variation in the stiffness but it could affect the mechanical behavior of the entire structure to a considerable extent. Cracks may be caused by fatigue under service conditions as a result of the limited fatigue strength. They may also occur due to mechanical defects. Another group of cracks are initiated during the manufacturing processes. Generally they are small in sizes. Such small cracks are known to propagate due to fluctuating stress conditions. If these propagating cracks remain undetected and reach their critical size, then a sudden structural failure may occur. The cracks present in the structure interrupt the continuity of the assembly in most of the engineering structures like beam, columns in which geometrical properties can also be altered. Cracks caused due to fatigue stresses or stress concentration reduces the natural frequency and change mode of vibration due to local flexibility induced by the crack. All these effects due to concentrated cracks have been exclusively discussed in

this literature. A crack is modeled by describing the variation of the stiffness matrix of the member in the vicinity of a crack. The presence of a crack in a structural member introduces a local compliance that affects its response to varying loads. The change in dynamic characteristics can be measured and lead to identification of structural alteration, which at the end finally might lead to the detection of a structural flaw. Considering above mentioned facts, present research work is devoted to investigations contributions of researchers in the field of cracked concrete beams.

2 CONTRIBUTIONS OF THE RESEARCHERS

Following are the details of research contributions in the field of cracked beams.

1. Heydari et al. (2014)

In this paper, forced flexural vibration of a cracked beam is studied by using a continuous bilinear model for the displacement field. The effects of shear deformation and rotary inertia are considered in the model. The governing equation of motion for the beam is obtained using the Hamilton principle and based on the proposed displacement field. The equation of motion is given for a general force distribution. Then, the equation of motion has been solved for a concentrated force to present a numerical simulation of the method..

2. Biondini (2004)

The paper presents a three-dimensional finite beam element for damage evaluation and seismic analysis of concrete structures. The proposed formulation takes both mechanical and geometrical non-linearity into account. The measure of the seismic structural performance is based on a set of damage indices defined at different scales.

3. Shahnewaz et al. (2012)

A predominant failure mode in deep beams is shear failure which is a brittle and sudden and can lead to catastrophic consequences. Therefore, it is necessary to investigate the shear deficiency of deep beams under seismic loads. This paper aims to investigate the seismic performance of reinforced concrete deep beams structure. A reinforced concrete structure with a deep beam in the first storey was selected from the literature and was analyzed.

4.Salawu (1997)

Assessment procedures using vibration monitoring is discussed in the paper. The approach is based on the fact that natural frequencies are sensitive indicators of structural integrity. Thus, an analysis of periodical frequency measurements can be used to monitor structural condition. Since frequency measurements can be cheaply acquired, the approach could provide an inexpensive

structural assessment technique. The relationships between frequency changes and structural damage are discussed.

5. Ghodge et al. (2018)

This paper presents the numerical results of Vibration analysis of a cantilever beam with load at the tip and simply supported beam with the center load. Modal analysis of a cantilever beam and simply supported beam were carried out in ANSYS for different materials. The results were compared and it was found that for the same cross-section and for both configurations (i.e. cantilever and simply supported) structural steel gives higher natural frequencies.

6. Dive et al. (2017)

Experimental Modal Analysis (EMA) is a method to predict the behavior of a system by effectively using the modal or vibration data. It helps in understanding and evaluating the dynamic behavior of a system in actual scenario. In this paper, an attempt is made to study the free vibration analysis of the cantilevered beams of different materials and lengths.

7. Vishwarkarma and Bhaskar (2017)

In reinforced concrete structures, portions of columns that are common to beams at their intersections are called Beam-Column Joint. Beam-column joint is an important part of reinforced concrete frames in terms of seismic lateral loading. The two major failure at joints are, joint shear failure and end anchorage failure. As we know that nature of shear failure is brittle so the structural performance cannot be accepted especially in seismic conditions. This study presents design as well as detailing of beam-column joint of the structure. From this paper we get a review on the behavior of joints under ACI 352R-02 and IS13920:1993 code.

8. Mekalke and Sutar (2016)

Structural elements, supporting motors or engines are frequently seen in technological applications. The operation of a machine may introduce additional dynamic stresses on the beam. It is important, then, to know the natural frequencies of the coupled beam-mass system, in order to obtain a proper design of the structural elements. This paper aims at determining the natural frequencies and mode shapes of a cantilever beam of different material and geometries with different methods. The model allows analyzing the influence of the shear effect and spring-mass systems on the dynamic behavior of the beams by using equation, software and experimentation.

9. Lee et al. (2003)

Most of the building structures consist of structural elements such

as beams, columns, braces, shear walls, foundations, and floor slabs. In general, the models used for the analysis of building structures are prepared without the floor slabs assuming that they would have negligible effects on the response of a structure. Therefore, the floor slabs are simply replaced by rigid floor diaphragms for the efficiency in the analysis. Several researchers attempted to study the effects of floor slabs using finite element models with refined plate element meshes to account for the flexural stiffness of floor slabs. Since beams and floor slabs are not located in a common plane, in general, rigid bodies shall be introduced to represent the T-beam effects.

10. Sharma et al. (2011)

Seismic performance of reinforced concrete (RC) framed structure can be assessed with various analytical tools that may broadly be classified as linear elastic procedures and non-linear or inelastic analysis procedures. Since the reinforced concrete structures generally go in the inelastic range due to seismic loading, inelastic procedures predict the performance of the structures in a much better and realistic way than the linear elastic procedures. However, at the same time, the inelastic procedures are computationally much more demanding. Thus, a good balance between accuracy and computational effort is often sought for. Often, important structures are analyzed using inelastic procedures so that the actual performance of the same can be assessed under earthquakes, whereas less important structures are analyzed using linear procedures. To assess the seismic behavior of RC framed structures, various experimental procedures are used.

11. Jain et al.(2016)

Present study presents comparative analysis of flat slab system and wide beam system in reinforced concrete buildings. The comparison is performed with reference to conventional moment resisting frame. A G+3 building model is selected and is modeled as conventional beam column system, flat slab system and wide beam system. These models are then analyzed for gravity loads and seismic loads. For seismic analysis, two different methods-linear static and linear dynamic are used.

12. Chati et al. (2017)

This paper addresses the problem of vibrations of a cracked beam. In general the motion of such a beam can be very complex. This phenomenon can be attributed to the presence of the nonlinearity due to the opening and closing of cracks. The focus of this paper is the modal analysis of a cantilever beam with a transverse edge crack. The nonlinearity mentioned above

has been modeled as a piecewise linear system. In an attempt to define natural frequencies for this piecewise linear system\ the idea of a bilinear frequency is utilized. The bilinear frequency is obtained by computing the associated frequencies of each of the linear pieces of the piecewise linear system. The Finite element method is used to obtain the natural frequencies in each linear region.

13. Akbani and Verma (2013)

The presence of microstructural defects such as cracks is known to have resulted in catastrophic failures. These failures lead to enormous loss of resources including human lives. To help prevent such losses, the scientific community has been studying the mechanics of crack propagation and trying to develop methods for early detection of cracks. Out of the various alternative techniques being explored, study of the impact of crack presence on the flexibility and vibration response of the structural or machine elements has gained popularity in past few decades. It is based on the theory, supported by observations, that the presence of crack in any structure/machine element alters its dynamic response and thus, this change in the response can be used as an indicator to predict presence of cracks. In order to have an insight into the effects of crack on the response parameters, one has to carry out several repeated simulations.

14.Sutar (2012)

This paper describes the finite element analysis of a cracked cantilever and analyzes the relation between the modal natural frequencies with crack depth, modal natural frequency with crack location. Also the relation among the crack depth, crack location and natural frequency has been analyzed. Only single crack at different depth and at different location are evaluated. And the analysis reveals a relationship between crack depth and modal natural frequency.

15. Choudhari and Patil (2016)

Every faulty structure subjected to change in local flexibility which affects vibration response of the structure. Therefore it is necessary to detect the faults in the structure with its position. In this paper, aluminum un-crack and crack cantilever beam is used for analysis.

16. Waghulde and Kumar (2014)

Vibration analysis of a beam is an important and peculiar subject of study in mechanical engineering. Many developments have been carried out in order to try to quantify the effects produced by dynamic loading. Examples of structures where it is particularly important to consider dynamic loading effects are the construction

of tall buildings, long bridges under wind-loading conditions and buildings in earthquake zones, etc. Dynamic structures subjected to periodic loads compose a very important part of industrial machineries. One of the major problems in these machineries is the fatigue and the cracks initiated by the fatigue. These cracks are the most important cause of accidents and failures in industrial machinery. In addition, existing of the cracks may cause vibration in the system. Thus an accurate and comprehensive investigation about vibration of cracked dynamic structures seems to be necessary.

17. Batihan (2011)

In this thesis, transverse vibration of a cracked beam on an elastic foundation and the effect of crack and foundation parameters on transverse vibration natural frequencies are studied. Analytical formulations are derived for a beam with rectangular cross section. The crack is an open type edge crack placed in the medium of the beam and it is uniform along the width of the beam. The cracked beam rests on an elastic foundation. The beam is modeled by two different beam theories, which are Euler-Bernoulli beam theory and Timoshenko beam theory. The effect of the crack is considered by representing the crack by rotational springs. The compliance of the spring that represents the crack is obtained by using fracture mechanics theories. Different foundation models are discussed; these models are Winkler Foundation, Pasternak Foundation, and generalized foundation. The equations of motion are derived by applying Newton's 2nd law on an infinitesimal beam element. Non-dimensional parameters are introduced into equations of motion.

18. Ramachandran and Ponnudurai (2017)

If a crack appears in the structure it will cause catastrophic failure in the structure. It also affects natural frequency of the structure. Cracks in the structure are identified early to avoid catastrophic failure. Changes in vibrational parameters are required to be analysed to identify the crack. Location and depth of crack are the important parameters to change the vibrational parameters of the structure. Modal analysis is the most widely used method for crack identification of structures.

19. Quila et al.(2014)

The presence of cracks causes changes in the physical properties of a structure which introduces flexibility, and thus reducing the stiffness of the structure with an inherent reduction in modal natural frequencies. Consequently it leads to the change in the dynamic response of the beam.

This paper focuses on the theoretical analysis of transverse vibration of a fixed beam and investigates the mode shape frequency. All the theoretical values are analyzed with the numerical method by using ANSYS software and co relate the theoretical values with the numerical values to find out percentage error between them.

20. Prabhakar (2009)

In the present study, vibration analysis is carried out on a cantilever beam with two open transverse cracks, to study the response characteristics. In first phase local compliance matrices of different degree of freedom have been used model transverse cracks in beam on available expression of stress intensity factors and the associated expressions for strain energy release rates.

3 GAPS IN THE RESEARCH AND OBJECTIVES OF PROPOSED RESEARCH

Following section is devoted to gaps in the research and objectives of the proposed research, the details of which are presented as follows:

i. Gaps in the Research

Following are the research gaps investigated.

a) There is very limited research which focuses on modal analysis of cracked concrete beams;
b) There is very limited research work which tells about rankings of crack locations in the concrete beams.

ii. Objectives of the Research

Following are the objectives of present research work.

a) Modal analysis of cracked concrete beams; and
b) Rankings of cracked beams with respect to crack locations.

4 CONCLUSION

Present research work is devoted to academic aspects of the research work and investigates gaps in the research. Considering the contributions and practical applications of the targeted system, a new research may be expected in this field.

REFERENCES

1. Heydari, M., Ebrahimi, A., & Behzad, M. (2014). Forced vibration analysis of a Timoshenko cracked beam using a continuous model for the crack. *Engineering Science and Technology, an International Journal*, *17*(4), 194-204.
2. Biondini, F. (2004, August). A three-dimensional finite beam element for multiscale damage measure and seismic analysis of concrete structures. In *13th World Conference on Earthquake Engineering* (pp. 1-6). Vancouver, BC,, Canada: Paper No. 2963.
3. Shahnewaz, M., Rteil, A., & Alam, M. (2012, June). Seismic Effects on Deep Beams in a Reinforced Concrete Building. In *3rd International Structural Specialty Conference*.

4. Salawu, O. S. (1997). Detection of structural damage through changes in frequency: a review. *Engineering structures*, *19*(9), 718-723.
5. Ghodge, V., Bhattu, A. P., & Patil, S. B. (2018). Vibration Analysis of Beams. *International Journal of Engineering Trends and Technology (IJETT) – Volume 55 Number 2, 81-86.*
6. Vikas Dive, Mayur Bhosale, Vipil Chavan, Niranjan Durugkar (). Analysis of Natural Frequencies of Cantilever Beam Using ANSYS. International Research Journal of Engineering and Technology, 4 (5), 2724-2728.
7. Anant S. Vishwakarma, Gitadevi Bhaskar (2017). Analysis of Beam-Column Joint subjected to Seismic Lateral Loading" – A Review. International Research Journal of Engineering and Technology, 4 (11), 1350-1353.
8. Lee, D. G., Ahn, S. K., & Kim, D. K. (2003). An Efficient Model for Seismic Analysis of Building Structures with The Effect of Floor Slabs. In *7th Pacific Conference on Earthquake Engineering-7PCEE.*
9. Akanshu Sharma1, G.R. Reddy, R. Eligehausen, J. Hofmann, K.K. Vaze (2011). *Transactions,* SMiRT 21, 6-11 November, 2011, New Delhi, India.
10. Mohit Jain, Sudhir S. Bhadauria, Danish Khan (2016). Seismic analysis of flat slab and wide beam system. American Journal of Engineering Research 5 (10), 91-95.
11. Chati, M., Rand, R., & Mukerhjee, S. (1997). Modal analysis of a cracked beam. *Journal of sound and vibration*, *207*(2), 249-270.
12. Akbani, I., & Varma, I. Dynamic Analysis of a Structural Beam with Surface Crack Using Artificial Neural Network. International Journal of Scientific & Engineering Research Volume 6, Issue 5, 1975-1979.
13. Sutar, M. K. (2012). Finite element analysis of a cracked cantilever beam. *International Journal of Advanced Engineering Research and Studies*, *1*(2), 285-289.
14. Chaudhari, J. R., & Patil, C. R. (2016). Study of Static and Modal Analysis of Un-Crack and Crack Cantilever Beam Using FEA. *International Journal of Engineering Research and Technololgy*, *5*(4), 534-542.
15. Waghulde, K. B., & Kumar, B. (2014). Vibration analysis of cracked cantilever beam with suitable boundary conditions. *International Journal of Innovative Science, Engineering and Technology*, *1*(10), 20-24.
16. Kumar, A., & Kumar, V. Numerical Analysis of Crack Effect on Natural Frequency of Cantilever Composite Beam.
17. International Journal of Engineering Research, 1 (3), 1-6.
18. Al Çagri Batihan (2011). *Vibration analysis of cracked beams on elastic foundation using Timoshenko beam theory* (Doctoral dissertation, Middle East Technical University).
19. Ramachandran, C., & Ponnudurai, R. (2017). Modal Analysis of Beam with Varying Crack Depth. *International Journal of Engineering Research and Technololgy*, 452-458.
20. Quila, M., Mondal, S. C., & Sarkar, S. (2014). Free Vibration Analysis of an Un-cracked & Cracked Fixed Beam. *Journal of Mechanical and Civil Engineering*, *11*(3), 76-83.

A SURVEY ON UPFC BASED VOLTAGE COMPENSATION WITH ACTIVE POWER ANALYSIS

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Abstract- In recent years, power engineers are increasingly concerned over the quality of the electrical power. In modern power system consists of wide range of electrical, electronic and power electronic equipment in commercial and industrial applications. Since most of the electronic equipment is nonlinear in nature these will induce harmonics in the system, which affect the sensitive loads to be fed from the system. One among the many compensating devices is Unified Power Quality Conditioner (UPQC) which specifically aims at the integration of series-active and shunt-active power filters to mitigate any type of voltage and current fluctuations and power factor correction in a power distribution network, such that improved power quality can be made available at the point of common coupling. In this paper presents a comprehensive review on the unified power quality conditioner (UPQC) to enhance the electric power quality at distribution levels. This is intended to present a broad overview on the different possible UPQC system configurations.

Keywords: power quality (PQ), harmonics, voltage sag, voltage swell, active power filter (apf), unified power quality conditioner (UPQC).

1. INTRODUCTION

The quality of the power is effected by many factors like harmonic contamination, due to the increment of non-linear loads, such as large thruster power converters, rectifiers, voltage and current flickering due to arc in arc furnaces, sag and swell due to the switching (on and off) of the loads etc. These problems are partially solved with the help of LC passive filters. However, this kind of filter cannot solve random variations in the load current waveform and voltage waveform. Active filters can resolve this problem, however the cost of active filters is high, and they are difficult to implement in large scale. Additionally, they also present lower efficiency than shunt passive filters [1]. been reported in the last five years, which indeed suggest the rapid interest in utilizing UPQC to improve the quality of power at the distribution level [2], [3]. The UPQC is a

combination of series and shunt active filters connected through a common DC link capacitor. The main purpose of a UPQC is to compensate for supply voltage power quality issues such as, sags, swells, unbalance, flicker, harmonics, and for load current power quality problems such as, harmonics, unbalance, reactive current and neutral current [4].

2. POWER QUALITY PROBLEMS

Power quality is very important term that embraces all aspects associated with amplitude, phase and frequency of the voltage and current waveform existing in a power circuit. Any problem manifested in voltage, current or frequency deviation that results in failure of the customer equipment is known as power quality problem. The increasing number of power electronics based equipment has produced a significant impact on the quality of electric power supply. The lack of quality power can cause loss of production, damage of equipment or appliances, increased power losses, interference with communication lines and so forth.

3. BASIC CONFIGURATION OF UPQC

The Unified Power Quality Conditioner is a custom power device that is employed in the distribution system to mitigate the disturbances that affect the performance of sensitive and/or critical load [19]. It is a type of hybrid APF and is the only versatile device which can mitigate several power quality problems related with voltage and current simultaneously therefore is multi functioning devices that compensate various voltage disturbances of the power supply, to correct voltage fluctuations and to prevent harmonic load current from entering the power system. The system configuration of a single-phase UPQC is shown in Fig. 5. Unified Power Quality Conditioner (UPQC) consists of two IGBT based Voltage source converters (VSC), one shunt and one series cascaded by a common DC bus. The shunt converter is connected in parallel to the load. It provides VAR support to the load and supply harmonic currents. Whenever the supply voltage undergoes sag then series converter injects suitable voltage with supply [2]. Thus UPQC improves the power quality by preventing load current harmonics and by correcting the input power factor. The main components of a UPQC are series and shunt power converters, DC capacitors, low-pass and high-pass passive filters, and series and shunt transformers The main purpose of a UPQC is to compensate for supply voltage power quality issues, such as, sags, swells, unbalance, flicker, harmonics, and for load current power quality problems, such as, harmonics, unbalance, reactive

current, and neutral current. The key components of this system are as follows.

1) Two inverters —one connected across the load which acts as a shunt APF and other connected in series with the line as that of series APF.
2) Shunt coupling inductor Lsh is used to interface the shunt inverter to the network. It also helps in smoothing the current wave shape. Sometimes an isolation transformer is utilized to electrically isolate the inverter from the network.
3) A common dc link that can be formed by using a capacitor or an inductor.
4) An LC filter that serves as a passive low-pass filter (LPF) and helps to eliminate high-frequency switching ripples on generated inverter output voltage.
5) Series injection transformer that is used to connect the series inverter in the network. A suitable turn ratio is often considered to reduce the voltage and current rating of series inverter.

4. OPERATION STRATEGY

Loads, such as, diode bridge rectifier or a thyristor bridge feeding a highly inductive load, presenting themselves as current source at point of common coupling (PCC), can be effectively compensated by connecting an APF in shunt with the load[4-6]. On the other hand, there are loads, such as Diode Bridge having a high dc link capacitive filter. These types of loads are gaining more and more importance mainly in forms of AC to DC power supplies and front end AC to DC converters for AC motor drives. For these types of loads APF has to be connected in series with the load [21]. The voltage injected in series with the load by series APF is made to follow a control law such that the sum of this injected voltage and the input voltage is sinusoidal. Thus, if utility voltages are non-sinusoidal or unbalanced, due to the presence of other clients on the same grid, proper selection of magnitude and phase for the injected voltages will make the voltages at load end to be balanced and sinusoidal. The shunt APF acts as a current source and inject a compensating harmonic current in order to have sinusoidal, in phase in putcurrent and the series APF acts as a voltage source and inject a compensating voltage in order to have sinusoidal load voltage. The developments in the digital electronics, communications and in process control system have increased the number of sensitive loads that require ideal sinusoidal supply voltage for their proper operation. In order to meet limits proposed by standards it is necessary to include some sort of compensation. In the last few

years, solutions based on combination of series active and shunt active filter have appeared [8-9]. Its main purpose is to compensate for supply voltage and load current imperfections, such as sags, swells, interruptions, imbalance, flicker, voltage imbalance, harmonics, reactive currents, and current unbalance.

5 LITERATURE REVIEW

Further VSC is used to convert DC to AC.VSC is IGBT or GTO based electronic circuit to conduct this switches gate pulse is required so controller are use to generate the gate pulse for power electronic switch of VSC. Different types of controllers are like P, PI, PID, Fuzzy, ANN etc. In this paper PI, Fuzzy and ANN controller are used so the understand the concept of this controller no of papers are studies as below.

B. GOPAL ET AL [1] presented the power quality problems which can affect the performance of distribution system. UPQC is the equipment which can deal with both load current and supply voltage disturbance UPQC as a tool which maintained the power quality at distribution level. The UPQC is manage the supply voltage power quality problems such as sags, swells, unbalance flicker, harmonics, unbalance, reactive current and neutral current.

SWAPNIL. Y. KAMBLE ET AL [2] presented the control strategy for the UPQC system operation. With this method both source voltage distortion and load current harmonic compensation can be done at the time. The purposed use only source voltage measurement for SAF control based onSRF theory. For the control of PAF using instantaneous reactive power theory requires measurement of load current only.

YASH PAL ET AL [3] perform the UPQC has been investigated under various practical situations. The performance of UPQC should be deriving in term of various power quality improvements like load balancing power factor correction voltage sag and current harmonic mitigation. The performance of UPQC can be further improved by suitable tuning of PI controller.

MR. SHAKTISINH N. GOHIL ET AL [4] present the power quality problems which can affect the performance of distribution system. The review of the UPQC enhances the electric power quality at Distribution side. The UPQC is able to compensate supply voltage power quality issue such as sags, swells, unbalance, flicker, and harmonics and for load current power quality problem such as harmonic unbalance, reactive current and neutral current. Several type of UPQC configuration has been discussed.

K. S. SRIKANTH ET AL [5] has introduced system level concept and implementation aspects aiming at grid inter facing architecture in the future grid with enhanced voltage quality. The simulation result obtained for the grid interfacing using series and parallel converter system with conventional PI controller and Fuzzy Logic controller. Due to the presence of nonlinearity in the system harmonic will produce which leads to voltage distortion. By using conventional PI controller in the system we can reduce the distortion. The conventional PI controller has been design with fixed gain it failed to provide the best control performance. This drawback can be overcome by adopting Fuzzy set theory.

K.R.SUJA ET AL [6] present a new control method for UPQC using minimum active power injection technique. The conventional UPQC cannot mitigate the voltage sag effectively. The limitation of the conventional UPQC is rectified by the proposed minimum active power injection method. A new control technique and mathematical models were framed and then simulated by MATLAB/SIMULINK.

K.S.RAVI KUMAR ET AL [7] a work of the UPQC is to derive accurately and quickly reference signal are derived. Different controller used by UPQC to solve out power quality problems. The controllers are PI, Fuzzy and ANN. FLC proposed scheme eliminate both voltages as well as current harmonic effectively.ANN is also work like the FLC but it is better than the FLC.

RVD RAMA RAO ET AL [8] says that power quality problem are occur in many ways like nonlinear load such as large thyristor power converters, rectifiers voltage and current flickering arc furnace sag and swell produce by switching. Solution of this problems are using UPQC is the best way to solve out this problem. In this research paper work on PI and ANN controller of the UPQC is done in detail.

A.KAZEMI ET AL discuss a new method for UPQC control based on calculation of reference signal in time domain is discuss. This method is very simple and fast act based on the conditions of network in any time to remove any power quality problem from the distribution system.

6 CONCLUSION

After studding number of research paper it is conclude that UPQC is used as a power quality improvement device. Power quality issue are harmonic, voltage sag, voltage swell, compensation of reactive power. It is with great pleasure that we express our deep sense of gratitude to her for her

valuable guidance and constant encouragement throughout this work.

REFERENCES

1. B.Gopal, Pannala Krishna Murthy and G.N. Sreenivas "A Review on UPQC for power Quality Improvement in Distribution System" Global Journal of Researches In Engineering volume 13 issue 7 versions 1.0 year 2013.
2. Swapnil. Y. Kamble and Madhukar. M. Waware "Unified Power Quality Conditioner for Power Quality Improvement With Advanced Control Strategy "ISSN 978-1-4673-5090-7/13, IEEE Press year 2013.
3. Yash Pal, A. Swarup , Senior member IEEE and Bhim Singh Senior Member IEEE "Performance of UPQC for Power Quality Improvement" ISSSN: 978-1-4244-7781-4/10 IEEE Press Year 2010.
4. MR. Shaktisinh N. Gohil and Prof M.V. Makwana" A Comparative Analysis of UPQC for Power Quality Improvement" ISSSN:0975-6736 Nov To Oct 2013 Volume-02, Issue-02.
5. K.S.Srikanth, Krishna Mohan and P Vishnuvardhan "Improvement of Power Quality for Microgride using Fuzzy based UPQC Controller" by IEEE press Year 2015.
6. K. R. Suja and I. Jacob Raglend" Fuzzy Based UPQC for Power Quality Improvement" ICCPCT-2013 978-1-4673-4922-2/ 2013 IEEE Press
7. K.S.Ravi Kumar and S.V.A.R Sastry " Application of PI, Fuzzy Logic and ANN in Improvement of Power Quality using UPQC" Chennai and Dr.MGR University Second International Conference on Sustainable Energy and Intelligent System (SEISCON 2011) july 20-22, 2011 pp-316to319.
8. RVD Rama Rao and Dr. Subh ransu Sekhar. Dash "power Quality Enhancement by Unified Power Quality Conditioner Using ANN with Hysteresis Control" International Journal of Computer Application volume 6- No 1 september 2010
9. A.Kazemi, R. Rezaaeipour "Introducing a New Method for UPQC Control to Solve the Power Quality Problems" 978-1-4244-1718-6/08 IEEE press 2008.

MARKETING STRATEGY FOR POSITIVE YOUTH DEVELOPMENT FOR MENTAL HEALTH PROMOTION

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Abstract: There will be a phenomenal Growth in the youthful populace overall Also particularly clinched alongside India mental wellbeing for childhood is a territory from claiming developing concern. The scope from claiming merging of the fields of sure adolescent improvement mental wellbeing advancement around adolescent is getting to be apparent in the late times. Those paper plans with give and short diagram of the field of PYD Scrutinize to India and thought of meanings to using this structure to young mental wellbeing advancement. A fast survey might have been conveyed out to analyze Indian Scrutinize ahead sure young improvement its importance for mental wellbeing advancement through childhood engagement.
Keywords: Positive youth development, Youth engagement.

1. INTRODUCTION

There need aid social, cultural, political recorded contrasts in the approach young will be characterized over countries. Over India, childhood is characterized similarly as the individuals inside the agdistis range from claiming 15 on 29. Something like 356 million people for India need aid the middle of the ages about 10 will 24 a considerable length of time that implies that harshly one for each third individual is an adolescent persnickety. India, in this sense is an adolescent country, with regarding 30% of its populace being young. This will be alluded with similarly as those „demographic dividend" highlights the key part of Contributing deliberations previously, youth-centric activities.

It will be in the over connection that the wellbeing about young expects fundamental vitality on national talk. Mental wellbeing issues need raised concerning illustration those single the vast majority normal reason for inability "around youngsters and also a way wellbeing issue confronted the individuals for rising adulthood. It will be discovered that 75% of the kin for adult-type psychiatric issue have those onset about their mental wellbeing issue in front of the period for 24 A long times. A meta-

analysis indicated the predominance from claiming mental issue should be 22. 2 for every 1000 "around 15-24 quite some time old people in India. Forty percent about men Also 5% from claiming ladies inside the period extend for 15-24 a considerable length of time need been accounted for to a chance to be utilizing tobacco across the nation.

1.1 Youth mental health: challenges

A few tests would news person done managing the mental wellbeing issues of youngsters. Mental illnesses start right on time Previously, life, Also Along these lines keep youngsters from accomplishing their possibility every now and again persimmon tree under adulthood, creating deep rooted trouble Also inability. Yet an additional test will be the medicine gap, with main 10-15% of the youngsters for mental wellbeing issues getting assistance starting with those accessible mental wellbeing forethought administrations. Medicine shirking is essentially higher around youthful guys over around females, a finding seen crosswise over investigations. Around the individuals who do look help, there is normally a huge delay from those run through from claiming onset of the issue of the to begin with medicine contact. There appears to be should need been a apparent carelessness starting with the pop culture for young mental wellbeing forethought. It is opined that the mental wellbeing mind framework may be the weakest the place it necessities will make those strongest.

2. METHODS

A fast Audit might have been conveyed out to analyze Indian Scrutinize looking into sure childhood improvement and its significance for mental wellbeing advancement through adolescent engagement. A key-word driven scan might have been conveyed out in that month about April 2017, utilizing EBSCO, ProQuest Also MedIND as those electronic databases, with no confinement in the time-period of the distributed investigations. Two sets of enter words, „Positive young development India were mutually utilized as happening previously, whatever content field. Similarly as this method, brought about best a little number for articles; An supplementary hunt of titles (using Google hunt engine) of the accompanying Indian diaries might have been conveyed crazy to those time from 2010 till date: diary of tyke and juvenile mental Health, diary of Indian Academy of connected Psychology, mental Studies, Indian diary for clinical Psychology, worldwide diary about Indian Psychology, Indian diary from claiming Psychiatry, Indian diary about mental Medicine,

Indian diary about Group brain research. Those supplementary scan incorporated look of the repossess from claiming Indian doctoral theses accessible once Shodhganga, A web-based stage. The supplementary scan included a iterative transform Also entailed quest of the titles about articles during those principal level to identikit possibly applicable investigations Also thusly those examine of the abstracts Also full content of the shortlisted articles. A endeavor might have been committed on sit tight over-inclusive to start with, incorporate numerous investigations in the initial phase of supplementary hunt that were programmatic/intervention based, so as should dodge the danger from claiming sifting crazy important investigations When examination from claiming abstracts.

3. RESULTS

3.1 PYD research: the Indian scenario

The search indicated a significant paucity of Indian literature on positive youth development. There were eight articles that were retrieved through search of EBSCO database whereas the supplementary search of specific journals as mentioned earlier threw up 13 articles. The search of MedIND and ProQuest resulted in three articles. These studies were examined jointly by the first and the second author for their relevance to the review. Nine studies could be retained as per the inclusion criteria mentioned earlier.

3.2 Summary of PYD studies

3.2.1 Non-intervention Studies

Vision Foundation, New Delhi (2003) carried out an evaluation of nine youth development programs under Nehru Yuva Kendra Sangathan (NYKS), an autonomous organization under Ministry of Youth Affairs & Sports, Government of India, catering to the developmental needs of non-student rural youth in the age group of 15-35 years, with the objective of mobilizing and organizing rural youth who are not attending the schools and colleges. The study involving 744 informants, selected from over 16 districts in the six States (Assam, Bihar, Jharkhand, Orissa, West Bengal and Manipur), used in-depth interviews, group discussions and observations for data collection. It was found that youth clubs played a major role in enrolling youth for the various programmes. Among the programs arranged, programmes on awareness of social issues (92%) led the list. Moreover, 96% of the informants reported that they had been benefited by NYKS programmes. More than 80% of the youth reported positive impact of the programmes and activities of NYKS associated with regular

contact (once a month) with an official of NYKS.

4. DISCUSSION

The review suggests that PYD programs and PYD based mental health promotion programs are in a nascent stage in India with a severe dearth of published literature on the same. In view of this, it was considered useful to place the review findings in the broader context of youth development programs and intervention studies in the Indian research literature.

There would a couple activities around mental wellbeing advancement that use a quality built approach ordinary for PYD to mental wellbeing advancement. To example, assessment of Feeling great completing Well, An mental wellbeing primitive intercession project to school young demonstrated that those project might have been connected with noteworthy change for prosperity self-efficacy appraisals and also decrease clinched alongside mental trouble Also these additions stayed stable during An four month catch up.

5. LIMITATIONS

The Audit needs a few confinements. It might have been restricted to best three databases in particular EBSCO MedIND ProQuest separated from supplementary searches of a few Indian diaries. Not every last one of supplementary searches Might a chance to be conveyed crazy utilizing look capacity required visual filtering for titles consequently those abstracts. Those supplementary hunt might have been set to the time spanning 2010 till date yet all the a couple diary sites didn't bring those most recent issues accessible on the web so far. The Audit Might not fuses unpublished dissertations theses that were not uploaded for Shodhganga. The supplementary quest might have been not a thorough hunt about every last one of Indian diaries Anyway might have been confined will a couple pertinent Also consistently distributed brain science Psychiatry diaries (counting applied, community, clinical certain psychology) Psychiatry.

6. CONCLUSION

Childhood will be a period about defenselessness and in addition a period portrayed by developmental chances. Consequently empowering young for mental wellbeing through PYD projects need key preferences As far as preparing them with distinguish basic mental wellbeing issues for self Also peers, participate for self improvement and companion help to mental wellbeing break obstructions will professional help looking for The point when needed, same time fortifying abilities that help personage Also societal improvement. The Audit uncovers

an intense deficiency from claiming such projects in the country, bringing about missed chances on cook of the double objectives for sure adolescent advancement mental wellbeing advancement.

REFERENCES

1. National Youth Policy. Ministry of Youth Affairs and Sports, Government of India, 2014. Available at: http://www.rgniyd.gov.in/sites/ default/files/
1. pdfs/scheme/nyp_2014.pdf. Accessed on 3 June 2017.
2. UNFPA Annual Report, 2014. Available at: http://www.unfpa.org/sites/default /files/pub-pdf/ UNFPA_annual_report_2014_en.pdf. Accessed on 3 June 2017.
3. World Health Organization. Child and Adolescent Mental Health Policies and Plans (Mental Health Policy and Service Guidance Package), 2005. Available at http://www.who.int/mental_health/ policy/Childado_mh_module.pdf. Accessed on 3 June 2017.
4. McGorry PD, Purcell R, Hickie IB, Jorm FM. Investing in youth mental health is a best buy. MJA. 2007;187:S5-S7.
5. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry. 2005;62:593-602.
6. Reddy VM, Chandrashekar CR. Prevalence of Mental and Behavioural Disorders in India : A Meta-analysis. Indian J Psychiatr. 1998;40:149–57.
7. Parasuraman S, Kishor S, Singh SK, Vaidehi Y. A profile of youth in India. National Family Health Survey (NFHS-3), India, 2005-06. Mumbai: International Institute for Population Sciences; Calverton, Maryland, USA: ICF Macro; 2009.
8. Patel V, Ramasundarahettige C, Vijayakumar L, Thakur JS, Gajalakshmi V, Gururaj G. for the Million Death Study Collaborators. Suicide mortality in India: a nationally representative survey. Lancet. 2012;379:2343–51.
9. World Health Organization. World report on road traffic injury prevention, 2004. Available at http://whqlibdoc.who.int/publicatio ns/2004/9241562609.pdf. Accessed on 3 June 2017.
10. Sunitha S, Gururaj G. Health behaviours & problems among young people in India: Cause for concern & call for action. Indian J Med Res. 2014;140:185–208.
11. Swami V. Mental health literacy of depression: gender differences and attitudinal antecedents in a representative British sample. PLoS One. 2012;7:e49779-10.
12. Rickwood D, Deane F, Wilson C: When and how do young people seek professional help for mental health problems? Med J Aust. 2007;187:S35-9.
13. Olfson M, Kessler RC, Berglund PA, Lin E. Psychiatric disorder onset and first treatment contact in the United States and Ontario. Am J Psychiatry. 1998;155:1415-22.
14. Kutcher S, Venn D. Why Youth Mental Health Is So Important. Medscape J Med. 2008;10:275.
15. Santhya KG, Prakash R, Jejeebhoy SJ, Singh SK. Accessing adolescent friendly health clinics in India: The perspectives of adolescents and youth, 2014. Available at: https://www.popcouncil.org/ uploads/pdfs/2014PGY_AFHC-IndiaReport.pdf Accessed on 3 June 2017.

16. Czyz EK, Horwitz AG, Eisenberg D, Kramer A, King, CA. Self-reported Barriers to Professional Help Seeking Among College Students at Elevated Risk for Suicide. J Am Coll Health. 2013;61:398–406.
17. Lerner RM, Steinberg L. The Scientific Study of Adolescent Development. Handbook of Adolescent Psychology; 2009;1:1.
18. Benard B. Fostering resiliency in kids: Protective factors in the family, school, and community. Portland, OR: Western Center for Drug-Free Schools and Communities; 1991. ERIC Document Retrieval No. ED335781
19. Lerner RM. Liberty: Thriving and civic engagement among America¨s youth. Thousand Oaks, CA: Sage Publications; 2004.
20. Small S, Memo M. Contemporary Models of Youth Development and Problem Prevention: Toward an Integration of Terms, Concepts, and Models. Fam Relat. 2004;53:3–11.
21. Sibereisen RK, Lerner RM. eds. Approaches to positive youth development. London: Sage Publications; 2007.
22. Lerner RM, Lerner JV, Almerigi J, Theokas C, Phelps E, Gestsdóttir S, et al. Positive youth development, participation in community youth development programs, and community contributions of fifth grade adolescents: Findings from the first wave of the 4-H Study of Positive Youth Development. J Early Adolesc. 2005;25:17-71
23. Hamilton S. A three-part definition of youth development. Unpublished manuscript, Cornell University College of Human Ecology, Ithaca, NY. 1999.

RECENT REVIEW AND APPROACHES FOR DEVELOPMENTS IN GROUND IMPROVEMENT SYSTEM

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Abstract- In recent years rapid development ofinfrastructures in metro cities compounded with scarcity ofuseful land and compelled the engineers to improve theproperties of soil to bear the load transferred by theinfrastructure e.g. Buildings, bridges, roadways railways etc.The engineering techniques of ground improvement areremoval and replacement, pre-compression, vertical drains,in-situ densification, grouting, stabilization using admixturesand reinforcement.

Keywords: Ground improvement, Geosynthetics, Vibrocompaction, Prefabricated vertical drains, Soil reinforcement.

1 INTRODUCTION

Ground improvement techniques are given the utmostimportance in present days to adapt week ground/soil intothe appropriate competent stable ground for different civilengineering applications.It started with Henri Vidal (1960) and became familiarwith the pioneer work of Binquet and Lee. Ground improvement techniques are recommended in difficultground conditions as mechanical properties are notadequate to bear the superimposed load of infrastructure tobe built, swelling and shrinkage property more pronounced,collapsible soils, soft soils , organic soils and peaty soils,karst deposits with sinkhole formations, foundations on dumps and sanitary landfills, handling dredged materialsfor foundation beds, handling hazardous materials incontact with soils, using of old mine pits as site forproposed infrastructure. When a project site come acrossany of the above difficult conditions, possible alternativesolutions may be one of among as avoid the particular site;design the planned structure (flexible/rigid) accordingly,remove and replace unsuitable soils, attempt to modifyexisting ground, enable cost effective foundation design, reduce the effects of contaminated soils, ensure sustainability in construction projects using ground

improvement techniques. While it may not be immediately apparent, ground improvement methods have made considerable advances since today's commonly practiced techniques began to develop in the 20th century however most techniques have gone through changes. This paper presents a review on research and development in the fieldof ground improvement.

2 MECHANICAL IMPROVEMENT TECHNIQUES

In this method soil density is increased by theapplication of mechanical force, including compaction ofsurface layers by static vibratory such as compact roller andplate vibrators.

This technique is further classified as:-

a) Dynamic Compaction
b) Vibro-Compaction
c) Compaction Grouting
d) Pre loading and Pre-fabricated Vertical Drains
e) Blast densification

3 HYDRAULIC MODIFICATION

The modification of soil properties are achieved byforcing the free pore water out of soil via drains or wells. Incase of course grained soils it is achieved by lowering theground water level through pumping from boreholes, ortrenches and for fine grained soils the long term applicationof external loads (preloading) or electrical forces(electrometric stabilization).

Some of the hydraulic modification method is:-

a) Preloading using fill
b) Preloading using fill with vertical drain
c) Vacuum preloading with vertical drains
d) Combined fill and vacuum preloading
    a. Preloading using fill

4 ELECTRO-OSMOSIS

It is a term used for process of electro chemicalhardening during electro osmosis by adding chemicals, such as sodium silicate or calcium chloride at the Anode. Under the influence of, the electric field, these chemicals permeate the ground, flowing in the direction of Cathode, while the Anode becomes a grout injection pipe.C. Soil CementStabilization using cement and other admixtures such asfly ash, blast furnace slag has been adopted in manygeotechnical and highway engineering projects. These applications include a) Shallow depth applications in thecase of improvement of sub grade, sub-base and base course of high ways and embankment material and b)stabilization of deep soil deposits such as soft soils andpeaty soils.Addition of small quantities of cement proved to bebeneficial and the degree of strength/stiffness required is the

basis for design and has been used in the stabilization of high ways and embankments. In large scale applications, depending on the strengthand stiffness required based on the type of soil, the quantities required are huge and need large scale machineryand special procedures are required in stabilization of deepsoils which are weak (Eg: peaty soils).

Benefits of the method are:

a. Increased strength and stiffness
b. Better volume stability
c. Increased durability
d. Factors influencing the strength and stiffness improvement
e. Cement content, water content combined into water/ cement (w/c) ratio.
f. Method of compaction.
g. Time elapsed between mixing and compaction.

Comprehensive reviews and descriptions of the variousmethods of deep mixing and applications have been given by Terashi (2003), Topolnicki (2004), Larsson (2005), Essler and Kitazume (2008) and Arulrajah et al. (2009).Standards such as BS EN 14679 (2005) for deep mixinghave been established.

5 CONCLUSIONS

This paper has attempted to offer a review of the recentdevelopment in of ground improvement techniques whichare widely used in the field of geotechnical engineering and will play a major role in the field and earthworkconstruction projects of many types in the years ahead. Asdescribed many technologies are now available, some thatare very old and some that are still developing andemerging, but perhaps not yet quite ready for routineapplication.

Some of the further research area among thekey problems is:-

a. How to best incorporate sustainability considerationsin ground improvement method selection and implementation giving consideration to embodiedenergy, carbon emissions, and life cycle costs.
b. How to improve and simplify constitutive modeling.
c. Development of practical, economical and environmentally safe biog eochemical methods for soil stabilization and liquefaction risk mitigation.
d. Development of databases for variability of soil andmaterial parameters required in the design of ground improvement.
e. Development of improved and more reliable methodsfor evaluating the long term durability of soils mixedwith binder.
f. Understanding creep mechanisms in soils and interaction of creep with semi-rigid inclusions.

It is anticipated that with continued research and fieldexperience in addressing challenges such as above, the sub disciplineof ground improvement will continue itsdevelopment and importance as a critical component ofsuccessful geotechnical engineering and construction.

REFERENCES

1. Hausmann, M (1990),—Engineering principles of Ground modification‖, McGraw-Hill Publications.
2. Binquet, J. & Lee, K.L. (1975), —Bearing capacity test on reinforcedearth slabs‖, Journal of Geotechnical Engineering Division, ASCE,101(12), 1241-1255.
3. Guido, V.A., Chang, D.K. & Sweeney, M.A. (1986), —Comparison of geogrid and geotextile reinforced earth slabs‖, Canadian Geotechnical Journal (23), 435-440.
4. Varaksin, S.(1981), —Recent development in soil improvement techniques and their practical applications‖, Sol compact Sols/Soils, Techniques Louis Menard, 15, rue des Sablons, Paris, 38/39-1981.
5. Liu, J. (2003), —Compensation grouting to reduce settlement ofbuildings during an adjacent deep excavation‖, Proc. 3rd Int. Conf.on Grouting and Ground Treatment, Geotechnical SpecialPublication120, ASCE, New Orleans, Louisiana, 2: 837-844.
6. Welsh, J.P., & Burke, G.K. (2000), —Advances in grouting technology‖, Proceedings of GeoEng 2000. Melbourne.
7. Van Impe, W. F. (1989),‖ Soil improvement techniques andtheirEvolution‖, Taylor & Francis.
8. Charlie, W.A., Jacobs, P.J., & Doehring, D.O. (1992), —Blasting induced liquefaction of an alluvial sand deposit‖ GeotechnicalTesting Journal, ASTM, 15(1): 14-23.
9. Bo, M.W., Chu, J., Low, B.K. & Choa, V. (2003), —SoilImprovement Prefabricated Vertical Drain Technique‖, ThomsonLearning.
10. Mitchell, J.K., & Katti R.K. (1981), —Soil Improvement‖ - State ofthe Art Report. 10th ICSMFE, Stockholm, 4: 509-565.
11. Karol, R.H. (2003), —Chemical Grouting and Soil Stabilization‖, 3rd:CRC Press.
12. Rahardjo, P. P. (2005), —The Use of bamboo & bakau piles for soil improvements and application of pile raft system for the constructionof embankment on peats and soft soils‖, Chapter 31, Ground Improvement- Case Histories, B. Indraratna & J. Chu (Eds.), Elsevier, 899-922.
13. Hausmann, M R (1984), —Engineering principles of Ground Modification‖.
14. Schafer et al (1997), —Ground Improvement, Ground Reinforcement, and Ground Treatment- Developments‖.
15. Warner, J.(2004), —Practical Handbook of Grouting, Soil, Rock, andStructures‖, John Wiley and Sons.
16. Chu, J., Varaksin, S., Klotz, U. and Menge, P. (2009), State of theArt Report- Construction Processes‖,17th Intl. Conf. on Soil Mech.and Geotech. Engrg.: TC17 meeting ground improvement, Alexandria, Egypt, 7 October 2009, 130.
17. Hamidi, B., Nikraz, H. and Varaksin, S. (2009), —A Review onImpact Oriented Ground

Improvement Techniques‖, Australian Geomechanics J., 44(2): 17–24.
18. Menard, L. and Broise, Y. (1975), ―Theoretical and PracticalAspects of Dynamic Compaction‖, Geotechnique, 25(3): 3–18.
19. D. Leshchinsky (2011),―Some issues in geosynthetic reinforcedwalls and slopes‖, Geotechnical Engineering journal of theSEAGS & AGSSEA, Vol. 42 No.1
20. G. Madhavi Latha et al (2007), ―Effects of reinforcement form onthe behavior of geosynthetic reinforced sand‖ Geotextiles and geomembranes 25, 23-32.

A CONCEPTUAL METHODOLOGY FOR REVIEW RESEARCH ON COMPUTING NETWORKS

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Abstract - In today's world most of the Internet applications are based on client/server model. The advantage of thisarchitecture is that the clients can be low computing power machines with small memory. Most of the client machines on the Internet today have the computing capability more than 100 times of a supercomputer of 1990. It has been observed that 95% computing power of these client machines remains unused [1]. The huge amounts of computing resources are available on the Internet for further use. On second sidebig volume of data generated from various scientific applications for analysis which require super computers for processing. The super computers are very costly in terms of money. At present the scientific computing society has beenfocusing towards lower computational costs. The advancement in new trend of modern architectures results inPeer-to-Peer (P2P). P2P model is developing as a new model because of its features to harvest the computing and storage power of sites connected to the network to make their underutilized resources available to others. In this paper we survey different frameworks of P2P network in which idle cycles from desktops or home PCs connected to the Internet will be used for solving the scientific computing problems. We also study about different issues like load balancing, security, incentives and fairness in P2P networks.
Keywords: P2P Networks, computing networks, distributed computing.

1. INTRODUCTION

In the present scenario maximum Internet applications are based on client/server model such as World Wide Web, Email, E-commerce, and core banking. The client/server model works in two distinct manners. The client connects to the server to request for services, and the server after getting the request provides the desired services to the client. Normally deploying and maintaining a server – sideprogram is complex and expensive. Deploying a web server requires machine with high computing power, large memory, server class software and high-speed Internet connection, which

are costly. The advantage of client/server architecture is that on the client side it has no additional requirement. Clients can be low computing power machines, with small memory and web browser.

When looking towards current scenario, most of the client machines on the Internet today have the computing capability more than 100times of a supercomputer of 1990. Statistics results shows therewere more than 1,966,514,816 Internet users by the month-end June 2010 [35]. In most of the research it is found that 95% computing power of these client machines remains unused [1]. Imagine that if at any one time 10 million 400MHz machines are connected to the Internet and only 10% of their resources remain unused. Then these 10% unused resources represent 40 X 10^8 MHz computing power and lot of memory space. These figures show that huge amount of computing resources is available on the Internet that must be used otherwise they are wasted [1]-[3].

2. RELATED WORK

In last few years, a number of P2P networking systems have been developed for various applications like filesharing and distributed computing. Napster, Gnutella, FreeNet are the example of filesharing systems while SETI@home is the example of the P2P computing system which is used to process the astronomical data only. SETI@home is the most successful application with the large number of contributors because of their exciting application theme"search for an extraterrestrial intelligence". Initial SETI project used thespecial super computers for the analysis of bulk data received from telescope. In 1995, David Gedye proposed the concept of a virtual super computer formed by large number of Internet connected computers for the analysis of the large amount of data received from telescope. The idea of David Gedye is implemented as SETI@home project which was launched in May 1999 and running successfully. In this project most of data received from telescopes are distributed to many PCs for processing by a centralized server and after completion the results are sent back to the centralized server [7]-[8].The online file sharing system called Napster is another example of P2P network. It is an online music file sharing system developed by Shawn Fanning. This system grants its users to upload and download MP3 files without any restriction. Napster maintains a directory of shared file at central location and to download a file peer issue queries to the directory server to find which peer hold the desired file.Napster's search mechanism is centralized but its file sharing

mechanism is decentralized. The downloading of files is done directly between the peers. The Napster was launched in July 1999 and closed by the courtorder in July 2001 due to violation of copyright rules [9]-[12]. Many researchershave been made to addressoperations and functional issues in P2P computing networks. A brief survey is presented below. Jerome Verbeke, Neelakanth Nadgir et al. in [16] presented a decentralized P2P computing framework for large-scale computation problems named as JNGI. In this model the computational resources are divided into groups according to their functionality. They suggest three peer groups: the monitor group, the worker group, and the task dispatcher group. The architecture of framework controls communication to small peer groups that enables the architecture to scale to a very large number of peers. Jean-Baptiste et al. in [17] added new types of groups called similarity groups into the JNGI project. These new groups were built on the basis of two criteria, qualitative (structural) or quantitative (performance). The qualitative criteria included OS type or JVM version whereas quantitative criteria included physical characteristics such as CPU speed, bandwidth, and RAM size. However, peer grouping totally based on geographic location parameter needs to be considered to improve the reliability. This middleware includes a hybrid job distribution scheme for load balancing over the P2P networks. This middleware considered the P2P network as flat organization without hierarchy or node grouping. ZhimingDai1, Zhiyi Fang et al., in [further proposed a JXTA based distributed computing system. In this they combined the load balancing and dynamic task allocation mechanisms. This framework distributes the job over the network for processing according to the processing efficiency and response speed of the peers.

3. ISSUES IN P2P COMPUTING NETWORKS

In the previous couple of years, the main target of research adds the realm of P2P computing was to develop communication protocols and frameworks to accomplish data sharing and data exchange. Most of the protocols and frameworks have been developed to support the information sharing within the P2P file sharing systems. There are only a few mechanisms available that use the computing power of the remote systems for computing purposes. one in all the P2P computing network systems such as SETI@home has a centralized website for distribution of jobs for processing

and result collection associated with astronomical data only. SETI@home is predicated on hybrid P2P network architecture. To increase the reliability and scalability decentralized systems are required. The pure P2P architecture is decentralized in nature. In such network scalability is improved by dividing the computational resources into groups. Selecting criteria for grouping the computing resources is that the beginning in designing of pure P2P ADP system. Various criteria are used for grouping peers like physical location of peers, qualitative like operating platforms and technology, and quantitative purposes like CPU speed, memory size etc. The problem is that if in an exceedingly group all the peers belong to same geographic location than just in case of any natural disaster or equipment failure therein area the full group is collapsed which affects the working of system thereby requiring grouping criteria supported physical locations also.

The pure P2P systems also require mechanisms for choosing resources from the big number of Internet connected nodes. In P2P system some peers may heavily loaded while a number of them remain idle for many of the time. To avoid this case decentralized load balancing mechanisms are needed. If real time applications want to use P2P computing networks to process data, they require predictable performance because tasks in these types of applications have deadline to be met. to raised utilize the idle resources in pure P2P computing network, efficient job partitioning, resource identification and cargo balancing mechanisms are required. Providing security in P2P networks could be a challenge. If any user wants to participate in P2P distributed processing application, it required to download and run an executable file on its own machine. The users don't trust one another. In client/server systems, the safety mechanism like firewall is employed to shield data and system from intruders and attacks. These styles of mechanisms don't seem to be successful in P2P systems because they need no such centralized point where the firewall is often deployed. In decentralized systems there's no central authority that may verify the protection and reliability of the files shared or job distributed. Any user on the network can share or distribute any file or code which will contain harmful contents like viruses. Therefore, new security concepts and mechanisms are required for the P2P computing

systems.

4. CONCLUSION

The majority of research adds the world of P2P networking has been dedicated for the event of file sharing networks. There are only a few mechanisms available for sharing of CPU cycles and use of those shared cycles for the big computing problems. Most of the P2P cycle sharing systems are partially decentralized within the nature and need a centralized system for the indexing and resource allocation process. To enhance the reliability and scalability of this sort of systems complete decentralization is required.

The Napster is employed for file sharing however it's supported hybrid P2P spec. The SETI@home is another hybrid P2P network application used for distributed computing. SETI@home system strongly relies on its server to distribute jobs to every participating peer and to gather results after processing is done. Thanks to the centralization in system the reliability and scalability issues are affected. SETI@home system is dedicated for the particular task only i.e., to process the info from astronomical dimensions. General users are not allowed to submit their own jobs for processing over SETI@home network. New systems are required where general users can submit their own job for processing and take the advantage of spare resources available on Internet.

The issues in P2P networks like load sharing, security, and fair allocation of resources consider hybrid or partially centralized P2P networks however to enhance the reliability and scalability of P2P network systems, complete decentralization is required.

REFERENCES

1. Ian J. Taylor, From P2P to Web Services and Grids Peers in a Client/Server World, pp.23-41, SpringerPublication London, 2005.
2. Harwood A., Balsys R.J., "Service Networks - Distributed P2P Middleware," In Proceedings of APAC Conference and Exhibition on Advanced Computing, Grid Applications and eResearch, 2003.
3. C.Lv, P.Cao, ECohen, K.Li, and S. Shenker, "Search and Replication in Unstructured P2P Networks," In Proceedings of ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Systems, pp.258-259, 2002.
4. Dejan S. Milojicic, Vana Kalogeraki, RajanLukose, Kiran Nagraja, Jim Prune, Bruno Richard, SamiRollins, Zhichen Xu, "P2P Computing," HP Lab Technical Report, HPL-2002-57R1, March 2002.
5. INTEL, "P2P-Enabled Distributed Computing," Intel White Paper, 2001.
6. V. Lo, D. Zappala, D. Zhou, Y. Liu,

and S. Zhao, "Cluster Computing on the Fly: P2P Scheduling ofIdle Cycles in the Internet," In Proceedings of 4th IEEE International Conference on P2P Systems (P2P'04), 2004.

7. David P. Anderson, Jeff Cobb, Eric Korpela, Matt Lebofsky, Dan Werthimer, "SETI@home: An Experiment in Public-Resource Computing," In Communications of the ACM, Volume 45, Issue 11, pp.56-61, November 2002.
8. Korpela, E., Werthimer, D., Anderson, D., Cobb, J., and Lebofsky, "SETI@home : Massively Distributed Computing for SETI," In Journal on Computing in Science and Engineering, Volume 3, Issue 1, pp.78 - 83, 2001.
9. Siu Man Lui, Sai Ho Kwok, "Interoperability of P2P File Sharing Protocols," ACM SIGecom Exchanges, Volume 3 No.3, pp.25-33, 2002.
10. S. Androutsellis-Theotokis and D. Spinellis, "A Survey of P2P File Sharing Technologies," White Paper, Electronic Trading Research Unit (ELTRUN), Athens University of Economics and Business, 2002.
11. Ulrike Lechner, "P2P Beyond File Sharing," In Proceedings of the 2nd International Workshop on Innovative Internet Computing Systems (IICS), pp. 229-249, 2002.
12. Stefan Saroiu, P. Krishna Gummadi, and Steven D. Gribble, "A Measurement Study of P2PFile Sharing Systems," In Proceedings of ACM/SPIE Multimedia Computing and Networking (MMCN '02), 2002.
13. B. Pourebrahimi, K. Bertels, S. Vassiliadis, "A Survey of P2P Networks," Proceedings of the 16th annual Workshop on Circuits, Systems and Signal Processing, ProRisc 2005, November 2005.
14. Beverly Yang and Hector Garcia-Molina, "Designing a Super-Peer Network," In Proceedings of 19th nternational Conference on DataEngineering, pp. 49, 2003.
15. Talia D., Trunfio P., "Toward a Synergy Between P2P and Grids," In IEEE Journal on Internet Computing, Volume 7, Issue 4, pp. 96 - 95, 2003.
16. Jerome Verbeke, NeelakanthNadgir, Greg Ruetsch, Ilya Sharapov, "Framework for P2P Distributed Computing in a Heterogeneous, Decentralized Environment," In Proceedings of the 3rd International Workshop on Grid Computing, pp.1-12, Year 2002.
17. Jean-Baptiste Ernst-Desmulier, Julien Bourgeois and Francois Spies, Jerome Verbeke, "Adding New Features in A P2P Distributed Computing Framework," In Proceedings of the 13th Euromicro Conference on Parallel, Distributed and Network-Based Processing (Euromicro-PDP'05), pp.34 - 41, 2005.
18. David R. Karger and Matthias Ruhl, "Simple Efficient Load Balancing Algorithms for P2P Systems," In Proceedings of the 16th annual ACM Symposium on Parallelism in Algorithms and Architectures (SPAA '04), pp. 36-43, 2004.
19. Ananth Rao, Karthik Lakshminarayanan, Sonesh Surana, Richard M. Karp, and Ion Stoica, "Load Balancing in Structured P2P Systems," In International Workshop on P2P Systems (IPTPS), pp. 68-79, 2003.
20. Yingwu Zhu and Yiming Hu,

"Efficient, Proximity-Aware Load Balancing for Structured P2P Systems," In Proceedings of the 3rd International Conference on P2P Computing (P2P '03), pp. 220, 2003.

21. Dan S.Wallach, "A Survey of P2P Security Issues," In International Symposium on Software Security (ISSS), pp. 42-57, 2002.

PROPERTIES AND ANALYSIS FOR POLY (VINYL ALCOHOL)/ ZINCOXIDE-CERIUMOXIDE NANOCOMPOSITES

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Abstract- With the objective to investigate the influence of zinc oxide–cerium oxide (ZnO-Ce_2O_3) nano-particles on the optical and electrical properties of polyvinyl alcohol (PVA), PVA/ZnO-Ce_2O_3 nano-composite films were prepared by solution intercalation method with different weight percentage viz., 0.5, 1.0 and 2.0 wt% of ZnO–Ce_2O_3 nano-particles. The fabricated nano-composites were characterized by Fourier transform-infrared spectroscopy (FT-IR), UV/visible and X-ray diffraction (XRD). The effect of ZnO-Ce_2O_3 nano-particles on the dielectric constant (ε′), dielectric loss (ε″), electric modulus (M′ and M″), ac conductivity (σac), and dielectric loss tangent (tan δ) over a range of frequencies at room temperature of PVA nano-composites have been studied. FTIR, UV visible and XRD analysis indicates the nature of ZnO-Ce_2O_3 nano-particles interaction with the PVA matrix. The morphological behavior of the nano-composites has been performed using scanning electron microscopy (SEM).
Keywords: Poly vinyl alcohol, Zink oxide.

1. INTRODUCTION

There is increasing research interest in polymeric nano-composites owing to improvements in electrical, thermal, optical, and mechanical properties [1] and their great potential for highly functional materials [2,3]. In particular, nano-particles embedded in a transparent matrix have attracted attention as advanced technological materials because of their high transparency, high refractive index [4], and attractive electrical/ electronic properties [5]. Metal oxide nano-composites play a very important role in electrical and optical devices. Polymeric nano-composites also demonstrate high thermal stability compared to virgin polymers [6].

In the present study, we selected poly (vinyl alcohol) (PVA) as a transparent host and zincoxide ceriumoxide (PVA/ZnO-Ce_2O_3) nano-particles as a nano-filler. PVA is a water-soluble polymer that allows preparation of

nano-composites film via environmentally friendly aqueous solution casting. PVA films are flexible and show excellent transparency in the visible range, with good dimensional stability. PVA films have very high dielectric strength (41000 kV/mm) and good charge storage capacity and dopant-dependent electrical and optical properties. Hence,

PVA films are of importance for the microelectronic industry. The electrical properties of PVA nano-composite films have been extensively investigated [7]. Their electrical conductivity depends on thermally generated carriers and dopants [8]. In the present investigation ZnO-Ce_2O_3 metaloxide nano-particles on the optelectrical properties of PVA matrices were studied.

Figure 1 UV (a) transmittance and (b) absorbance spectra of PVA/ZnO-Ce_2O_3 nano-composite films.

2. EXPERIMENTAL

Electrical properties were measured using an LCR meter (Wayne KERR model: 6500P) in a frequency range of 20Hz-10MHz, at voltage of 1V. UV-visible transmittance spectra were recorded using UV-ANALYTIK JENA (model Specord S600) in the wavelength range 220-300 nm. FTIR spectra of the samples were measured in the spectral range 4000-400 cm-1 using Perkin Elmer FT-IR. X-ray diffraction (XRD) patterns were recorded using Miniflex II, Desktop diffract meter (RIGAKU) (radiation, λ=1.54 Å, scanning speed of 3°/min and 2θ range of 0–60o. Surface images of PVA/Na_2ZrO_3 film samples were recorded by scanning electron microscopy (SEM, Model ESEM Quanta 200) at 10 KV voltages.

Table 1 Intensity of transmittance values of PVA and PVA/ZnO-Ce2O3 nano-composites.

ZnO-Ce_2O_3 in PVA (wt. %)	Peak intensity at different wave length in nm (%)		
	253	257	278
0.0	78	38	65
0.5	100	78	42
1.0	89	89	88
2.0	100	57	30

3. RESULTS AND DISCUSSION

The FTIR spectra of PVA and ZnO-Ce2O3 filled PVA are shown in Figure 1. A strong broad band in the wave number range 3000-3600 cm^{-1} is assigned to the O-H stretching vibration of PVA. A peak at 1715-1729 cm^{-1} corresponds to C=O stretching vibration (of vinyl acetate group of PVA) and peak at 1432 cm^{-1} corresponds to a C=C group in PVA backbone.

A shift in the peak position has been noticed corresponding to C=O stretch and C-O-C stretch

vibrations of PVA and is indicative of a positive interaction between hydroxyl groups of PVA and nano ZnO-Ce_2O_3. The hydroxyl groups of PVA have a very strong tendency to form charge-transfer complex with nO-Ce_2O_3 nano-particles through chelation.

3.1 Effect of ZnO-Ce_2O_3 content on optical transmittance characteristics of PVA

In the transmittance spectra, three prominent peaks are observed at 253, 257 and 278 nm in UV (220-300 nm) region for nano-composites. As illustrated in the transmittance intensity of the peaks varied with nano-particles concentration and it shows that the peak observed at 253 nm shows 100% transmittance in some of the compositions.

This has led to the presumption that the peak intensity variation corresponds to the formation of charge transfer complexes between ZnO-Ce_2O_3 nano-particles and hydroxyl groups of PVA. The dielectric constant, loss, conductivity and loss factor of PVA/ZnO-Ce_2O_3 nano-composite films as a function of frequency at different ZnO-Ce_2O_3 nano-particles concentration.

The dielectric constant (ε') values of composite films decrease with increase in frequency. This may be attributed to the tendency of dipoles in polymeric samples to orient themselves in the direction of the applied field. Dielectric loss (ε'') drops suddenly with an increase in frequency.

This behavior may be due to the fact that at lower frequencies, the dipoles have sufficient time to align with the applied field before it changes its direction.

Consequently, the dielectric loss is high. The conductivity increases with increase in frequency following the universal dielectric response law, $\sigma = A\,\omega n$, where, n is found to be very close to 1.

3.2. WAXS studies

The crystalline nature of synthesized nano ZnO-Ce_2O_3 was observed by sharp crystalline peaks in the XRD pattern of pristine ZnO-Ce_2O_3 distinct diffraction peaks at 2θ of and 57° are noticed for the nano-sized ZnO-Ce_2O_3. The X-ray diffraction patterns of pure PVA and PVA/ZnO-Ce_2O_3 nano-composites.

All the X-ray profiles of nano-composites exhibit a main peak at 2θ = 19.7° corresponding to (101) crystal plane for PVA, which indicates the semi crystalline nature of PVA. But new peaks at 2θ values of and 57° are observed in the X-ray profile of PVA/ZnO-Ce_2O_3 nano-composites. It clearly indicates the presence of ZnO-Ce_2O_3 nano-particles inside the PVA matrix.

4. CONCLUSION

The FTIR data of PVA/ZnO-Ce_2O_3 nano-composite films reveal the interaction between nano-particles and PVA. UV-visible analysis shows that the formation of charge transfer complexes between ZnO-Ce_2O_3 nano-particles and hydroxyl groups of PVA. The electrical properties of PVA nano-composite films strongly depend on frequency and ZnO-Ce_2O_3 content.

As ZnO-Ce_2O_3 content increase, the dielectric permittivity, dielectric loss and conductivity of PVA host increase. Dielectric loss tangent decreases with increase in filler content at lower frequency, but at higher frequencies the tan δ increases with increase in nano-particles content. AC conductivity (σac) of PVA/ZnO–Ce_2O_3 nano-composites increases with increasing frequency following the universal dielectric response law.

REFERENCES

1. D.-G. Yu, W.-C. Lin, C.-H. Lin, L.-M. Chang, M.-C. Yang, (2007) An in situ reduction method for preparing silver/poly (vinyl alcohol) nanocomposite as surface-enhanced Raman scattering (SERS)-active substrates, Materials Chemistry and Physics, 101 93-98.
2. V.V. Vodnik, J.V. Vukuvic, J.M. Nedeljkovic, The effect of silver nano-fillers on the properties of polystyrene, Colloid and polymer science, 287 (2009) 847.
3. S. Mahendia, A.K. Tomar, S. Kumar, (2010) Electrical conductivity and dielectric spectroscopic studies of PVA–Ag nanocomposite films, Journal of Alloys and Compound, 508 406.
4. M. Arellano, I. Mickel-Haciski, D.L. Feke, I. Manas Zloczower, (1996) Compat-ibilization of Titanium Dioxide Powders with Non-Polar Media: Adsorption of Anionic Surfactants and its Influence on Dispersion Stability", Journal of Coatings Tech-nology, 68, 103-112.
5. R. Kurnianto, Y. Murakami, M. Nagao, N. Hozumi, Y. Murata, IEEE Trans. Fundam. Mater. 127 (2007) 29.
6. S. Vyazovkin, I. Dranca, X.W. Fan, R. Advincula, Kinetics of the thermal and thermo-oxidative degradation of a polystyrene-clay nanocomposite, Macromolecular Rapid Communications, 25 (2004) 498.
7. R.Y.M. Huang, J.W. Rhim, (1993) Modification of poly(vinyl alcohol) using maleic acid and its application to the separation of acetic acid–water mixtures by the evaporation technique, Polymer International, 30, 129.
8. P.C. Mehendru, K. Pathak, K. Jain, P. Mehendru, Phys. Status Solid, 1 (1997) 403.

MULTI CRITERIA DECISION ANALYSIS BASED REMEDIATION ALTERNATIVES: A STUDY

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Abstract- Soil functions are critical for ecosystem survival and thus for ecosystems‟ provision of services to humans. In 2006, the proposed EU Soil Framework Directive introduced ecological, social and economic soil functions to be accounted for in land management practice. Ecological soil functions are a product of the complex interactions between living (biological) and non-living (physical and chemical) soil components. Social and economic soil functions are the benefits humans gain from ecosystems. Once a soil function is utilized by humans, it is usually called an ecosystem service. One of the major threats constraining proper functioning of the soil and thus provision of ecosystem services is soil contamination. Remedial actions typically only address the chemical soil quality. However, emerging regulatory requirements demand a holistic view on soil evaluation in remediation projects. Based on a prototype for sustainability appraisal of remediation alternatives using Multi-Criteria Decision Analysis (MCDA), this paper presents a structured and transparent approach for incorporating the soil function concept into a set of ecological, socio-cultural and economic criteria of the MCDA.

Keywords: Remediation, soil functions, soil ecosystem services, sustainability assessment.

1. INTRODUCTION

1.1. Background

Soil functions are critical for ecosystem survival and thus for ecosystems‟ provision of services to humans. The components of an ecosystem are dependent on a healthy soil to enable the entire ecosystem to function properly. The close relationship between soil functions and the ecosystem were recognized by scientists in the 1970-s (e.g. Lehmann and Stahr, 2010) and by politicians and decisionmakers in more recent years (COM, 2006). In 2006, the proposed EU Soil Framework Directive introduced seven ecological, social and economic soil functions to be accounted for in

land management practice. These include (i) biomass production, including agriculture and forestry; (ii) storing, filtering and transforming nutrients, substances and water; (iii) biodiversity pool, such as habitats, species and genes; (iv) physical and cultural environment for humans and human activities; (v) source of raw materials; (vi) acting as carbon pool; (vii) archive of geological and archeological heritage (COM, 2006). Being a subset of ecosystem functions, a soil function can be defined asa soil ecosystem service once it is utilized for benefit by humans (Dominati et al., 2010).

To describe ecological soil functions, soil scientists use soil quality indicators (SQIs) to address the physical, the chemical, and the biological soil elements with an equal degree of importance (e.g. Andrews et al., 2004; Doran and Zeiss, 2000; Schindelbeck et al., 2008). Balanced interconnections of these three soil quality elements are at the core of properly functioning soil. Unfortunately, inherited from the era of industrialization, soil contamination is a widespread threat to proper soil functioning throughout the world. Striving for addressing soil contamination, research and technical development in recent decades has resulted in a wide palette of available remediation techniques to improve chemical soil quality, i.e. reduction of contaminant concentrations and amounts in the soil to tolerable levels guided by intended land uses (e.g. Swedish EPA, 2009).

1.2. Aim and Paper Outline

This paper presents an approach to soil function evaluation for facilitating input on ecological effects of remediation alternatives in an MCDA framework for sustainability appraisal described by Norrman et al. (2012); Rosén et al. (2009; 2013). First, a brief description of the MCDA framework that forms the point of departure in this study is given in Section 2.1. Further, the paper describes an approach to soil function evaluation within the MCDA framework and presents a preliminary minimum data set (MDS) for soil function evaluation (Section 2.2).

2. A MULTI CRITERIA DECISION ANALYSIS FOR SUSTAINABILITY APPRAISAL

2.1 The MCDA Framewor

The MCDA framework developed by Rosén et al. (2009; 2013) uses the common sustainability model of the three pillars: ecology, economy, and socio-culture. In the economic domain, costs and benefits are measured quantitatively in monetary terms using Cost-Benefit Analysis (CBA) addressing the social profitability

criterion (Rosèn et al., 2008). In the ecological and socio-cultural domains however, qualitative scores are assigned to a number of key criteria. Each criterion is scored between -2 representing "very negative effect" and +2 representing "very positive effect" relative to a reference alternative. A score of 0 represents "no effect". Importantly, the effects of remediation alternatives are measured relative to the reference alternative, e.g. when no remedial action is taken.

The MCDA framework is based on a linear additive model (to rank the remediation alternatives) in combination with a non-compensatory method (to identify those alternatives which are regarded as not leading towards sustainability). The score of each criterion are added and integrated, together with the results of the CBA, into a normalized sustainability index. The most sustainable alternative is the one which generates the highest sustainability index.

2.2 Soil Function Evaluation within the MCDA Framework

To comply with the proposed EU Soil Framework Directive, the MCDA framework by Rosèn et al. (2009; 2013) aims to include soil function evaluation in the decision process. For integrating the soil function evaluation into sustainability appraisal of remediation alternatives, it is important to make a distinction between the ecological soil functions and the soil ecosystem services. The latter are related to the socio-economic effects. The effects of remediation on soil ecosystem services (iv) physical and cultural environment for humans and human activities (including recreation, aspiration services), and (vii) archive of geological and archeological heritage are addressed in the socio-cultural domain of the MCDA model. These soil ecosystem services correspond to and are to some extent covered by Local environmental quality and amenity and Cultural heritage criteria respectively. The soil abilities to serve as a (v) source of raw materials and to act as a (vi) carbon pool can be monetized and addressed in the economic domain of the MCDA model. (i) Biomass production including agriculture and forestry is not considered relevant in soil remediation projects. The effects on ecosystem services resulting from changes in soil quality are suggested to be evaluated using valuerelated measurements. These measurements can be expressed in: (1) community-based values which reflect attitudes, preferences, and intentions associated with a soil ecosystem service; (2) economic values revealed by market data (if any)

about a soil ecosystem service, or the willingness to pay (WTP) for the service provided by the end use of the soil (SAB, 2009).

The ecological soil functions are related to the internal functioning of a soil system. The effects of remediation alternatives on such ecological soil functions as (ii) storing, filtering and transforming nutrients, substances and water, and (iii) biodiversity pool such as habitats, species and genes are to some extent addressed by the Soil criterion of the MCDA model. Together with conventional risk assessment methods, soil quality indicators (SQIs), i.e. physical, chemical and biological soil properties, are used for evaluation of the effects of remediation alternatives on soil functions. The MDS was identified based on a literature review, primarily considering the works by Bone et al. (2010); Brown et al. (2005), Craul and Craul (2006), Doni et al. (2012), Epelde et al. (2008a,b; 2009; 2010a,b), Gugino et al. (2009), Jelnsic et al. (2013), Lehmann et al. (2008), Pazos et al. (2012); Schindelbeck et al. (2008), and van Herwijen et al. (2007). The suggested MDS is identified by compiling SQIs that are (1) suggested by three or more literature sources in the studies exploring the effects on ecological soil functions in remediation projects, and (2) consistent with the MDSs for the purposes other than agricultural productivity of land (Bone et al., 2010; Craul and Craul, 2006; Lehmann et al., 2008; Schindelbeck et al., 2008).

3. MARIEBERG CASE STUDY: EVALUATION OF THE EFFECTS ON ECOLOGICAL SOIL FUNCTIONS

The former Marieberg saw mill site is situated in northern Sweden (Aberg et al. 2010) and covers an area of approximately 1500 m x 150 m. Chlorophenol (CP) based wood preservatives was used for more than two decades until closure of the activities in 1970. The CP formulations were contaminated with polychlorinated -p-dibenzodioxins and dibenzofurans (PCDD/Fs). The CP formulations were contaminated with polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs, commonly called „dioxins"). These compounds are highly persistent organic pollutants, which tend to partition to particles rather than being dissolved and mobilized by water (Persson et al., 2008). As a result, the site is still heavily polluted with PCDD/Fs from many different activities (Aberg et al. 2010). The site includes areas that were used for sawing, impregnation, indoor storage, indoor drying, and an outdoo timber yard. Inside and just outside the area, there are residential houses, pastures for

dairy cows, a farm, a hostel, and a camping area. In a previous risk assessment study of the site (Aberg et al. 2010), human exposure to PCDD/Fs through a broad spectrum of exposure pathways was assessed. Soil, air, groundwater, raspberries, carrots, potatoes, grass, milk, and eggs were analyzed for the content of PCDD/Fs, and the results showed that most exposure media were clearly elevated as compared to national reference samples. The calculated exposure levels showed that a number of site-specific exposure routes can be of importance for people residing this area. Thus, despite low mobility of PCDD/Fs, these contaminants can be transferred from the polluted soil to other environmental media and into humans.

3.1 Results

The studied soils at the case study site were sands and sandy loams according to a FAO taxonomy triangle. Using the methodology for soil classification by Gugino et al. (2009), a mean index of 0.58 corresponding to soil class 3 and a medium soil function performance was computed for the analyzed soil samples. The mean score for potentially mineralizable nitrogen of 0.02 indicates limited biological activity in the soil. On the other hand, the mean scores for content of coarse material, pH and available water capacity were 0.85, 0.74 and 0.9 respectively, providing potentially favorable conditions for biological activity. The scores for available phosphorus and content of organic matter were 0.52 and 0.41 respectively thus limiting e.g. soil fertility.

A preliminary correlation analysis indicates dependencies between concentration of dioxins and organic matter content. A strong correlation between surface soil organic matter and organic pollutants has also been reported in other studies (e.g. Bergknut et al., 2010; Meijer et al., 2002; Meijer et al. 2003), but for sites contaminated directly from industrial activities rather than from atmospheric deposition, this correlation is expected to be less pronounced.

4. DISCUSSION AND CONCLUDING REMARKS

This paper shows the important distinction between soil functions and the soil ecosystem services (Section 2.2). The ecological soil functions are related to the internal functioning of a soil system, i.e. what the soil does in its natural state. The soil ecosystem services are related to the benefits humans gain from ecosystems. Further, in accordance with emerging regulatory requirements on soil protection, this work shows how effects on soil functions can be

included in sustainability appraisal of remediation alternatives.

REFERENCES

1. Aberg A, Tysklind M, Nilsson T, MacLeod M, Hanberg A, Andersson R et al. Exposure assessment at a PCDD/F contaminated site in Sweden - field measurements of exposure media and blood serum analysis. Environmental Science and Pollution Research 2010; 17 (1): 26-39.
2. Andrews SS, Karlen DL, Cambardella C A. The soil management assessment framework: a quantitative soil quality evaluation method. Soil Sci. Soc. Am. J. 2004; 68: 1945-62.
3. Bergknut M, Laudon H, Wiberg K. Dioxins, PCBs and HCB in soil and peat profiles from a pristine boreal catchment. Environ. Pollut. 2010; 158(7): 2518-25.
4. Bone J, Head M, Barraclough D, Archer M, Scheib C, Flight D, Voulvoulis N. Soil quality assessment under emerging regulatory requirements. Environment International 2010; 36: 609-22.
5. Brinkhoff P. Multi-Criteria Analysis for Assessing Sustainability of Remediation Actions: Applications in Contaminated Land Development. A Literature Review. Report No 2011:14, ISSN 1652-9162.
6. Gothenburg: Chalmers Reproservice; 2011.
7. Brown S, Sprenger M, Maxemchuk A, Compton H. Ecosystem Function in Alluvial Tailings after Biosolids and Lime Addition. J Environ Qual 2005; 34:139-48.
8. CL:AIRE. A framework for Assessing the Sustainability of Soil and Groundwater Remediation. London: CL:AIRE; 2010.
9. CL:AIRE. Annex 1: The SuRF-UK Indicator Set for Sustainable Remediation Assessment. London: CL:AIRE; 2011.
10. CB. Crystal Ball User's Guide, 11.1.2. Oracle USA, Inc., 500 Oracle Parkway, Redwood City, CA 94065; 2010.
11. COM. Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC. Brussels, Belgium; 2006.
12. Craul TA, Craul PJ. Soil Design Protocols for Landscape Architects and Contractors. New Jersey: John Wiley and Sons; 2006.
13. de Groot RS, Wilson MA, Boumans RMJ. A typology for the classification, description and valuation of ecosystem functions, goods and services. Ecological Economics 2002; 41: 393-408.
14. Doni S, Macci C, Peruzzi E, Arenella M, Ceccanti B, Masciandaro G. In situ phytoremediation of a soil historically contaminated by metals, hydrocarbons and polychlorobiphenyls. J Environ Monit 2012; 14: 1383-90.
15. Dominati E., Patterson M, Mackay A. A framework for classifying and quantifying the natural capital and ecosystem services of soil. Ecological economics, 2010; 69:1858-68.
16. Doran JW, Zeiss MR. Soil health and sustainability: managing the biotic component of soil quality. Appl Soil Ecol 2000; 15:3-11.
17. Egner H, Riehm H, Domingo WR. Untersuchungen über die chemische Bodenanalyse als Grundlage für die Beurteilung desNahrstoffzustandes der Boden, II: Chemische Extractionsmetoden zu Phosphor und Kaliumbestimmung. Kunliga

Lantbrukshügskolans Annaler 1960; 26: 199-215.
18. Epelde L, Hernȧndez-Allica J, Becerril JM, Blanco F, Garbisu C. Effects of chelates on plants and soil microbial community: Comparison of EDTA and EDDS for lead phytoextraction. Science of The Total Environment 2008a; 401(1-3): 21-8.
19. Epelde L, Becerril JM, Hernȧndez-Allica J, Barrutia O, Garbisu C. Functional diversity as indicator of the recovery of soil health derived from Thlaspi caerulescens growth and metal phytoextraction. Applied Soil Ecology 2008b; 39(3): 299-310.
20. Epelde L, Becerril JM, Mijangos I, Garbisu C. Evaluation of the efficiency of a phytostabilization process with biological indicators of soil health. Journal of Environmental Quality 2009; 38(5): 2041-9.
21. Epelde L, Becerril JM, Kowalchuk GA, Deng Y, Zhiu J, Garbisu C. Impact of Metal Pollution and Thlaspi caerulescens Growth on Soil Microbial Communities. Applied and Environmental Microbiology 2010a; 76 (23): 7843-53.
22. Epelde L, Becerril JM, Barrutia O, Gonza lez-Oreja JA, Garbisu, C. Interactions between plant and rhizosphere microbial communities in a metalliferous soil. Environmental Pollution 2010; 158: 1576-83.
23. Fanger G, Jones C, Jonsson K, Elander P, Pyyny M. Marieberg f.d. sågverk – Huvudstudie om markföroreningar m.m. Huvudstudierapport: miljöteknisk del. Kemikata Konsult Ab, Envipro Miljöteknik; 2007.
24. Gugino BK, Idowu OJ, Schindelbeck RR, van Es HM, Wolfe DW., Moebius-Clune BN et al. Cornell Soil Health Assessment Training Manual. 2nd ed. Ithaca: Cornell Digital Print Services; 2009.
25. Idowu OJ, van Es HM, Abawi GS, Wolfe DW, Ball JI, Gugino B K et al. Farmer-oriented assessment of soil quality using field, laboratory, and VNIR spectroscopy methods. Plant Soil 2008; 307: 243- 53.
26. ISO 3310-2 Test sieves – Technical requirements and testing – Part 2: Test sieves of perforated metal plate. International Standard Organization; 1999.
27. ISO 10381-6 Soil quality – Sampling. Guidance on the collection, handling and storage of soil for the assessment of aerobic microbial processes in the laboratory. International Organization for Standardization, 1993.
28. ISO 10390 Soil quality – Determination of pH. International standard organization; 2005.
29. Jelusic M, Grcman H, Vodnik D, Suhadolc M, Lestan D. Functioning of metal contaminated garden soil after remediation. Environmental pollution 2013; 174: 63-70.
30. Lehmann A, David S, Stahr K. TUSEC – A manual for the evaluation of Natural Soils and Anthropogenic Urban Soils. Bilingual edition. Stuttgart: Hohenheimer Bodenkundliche Hefte; 2008.

AN ANALYTICAL RESEARCH BASED ON CLOUD COMPUTING DEVELOPMENT

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Abstract- "Cloud Computing" is a procedure of changing over the contribution of one structure to some other wanted yield structure utilizing certain control activities. As per the idea, the information is called a precursor and the yield is known as the ensuing. A mapping capacity changes over the contribution of one structure to another type of wanted yield utilizing certain control activities. The processing idea is basically material to software engineering building. A typical cloud is both a proactive object and a reverse-constructed form of an existing statement reverse of cloud computing. An idea cloud is a conceptualized rundown of ideas that editors talk about as applicable to a subject, which are arranged as per their significance, significance, and conceptualization for example higher-request ideas come first. A framework, for instance, is a sort of idea cloud, yet considering grouping and request of priority.

Keywords: Soft computing, Cloud Computing, System Dynamics.

1. INTRODUCTION

Cloud based software development (CBSD) model depends on the plan to create programming parts and afterward to a mass them with a very much characterized programming engineering. Since the new software advancement worldview is totally different from the conventional methodology, quality confirmation for Computer based software development is another and fascinating theme with regards to the product designing network**.**

Software engineering projects are consistently dependent upon authoritative financial plan and timetable imperatives. Programming venture supervisors are the dependable individual for arranging and planning advancement venture. They direct the improvement work to guarantee that it is completed to the authoritative measures and screen the advancement of the undertaking. Undertaking director is additionally answerable for checking the improvement cost.

Programming designing is contrasts from other building exercises in various manners.

The administrator of a structural designing undertaking can perceive how an item is being created. Be that as it may, programming is an elusive item. Programming venture supervisors can just see the improvement of programming advancement by records delivered to survey the product procedure. In assembling the creation forms are persistently attempted and tried lastly, they might be normalized. Because of the fast mechanical changes in PCs and correspondences programming ventures are generally extraordinary somehow or another from past tasks. Encounter's structure past ventures for the most part may not be moved to another improvement venture. Due to these issues some product ventures may late, over spending plan and delayed.

2. SOFT COMPUTING FOR CLOUD DATABASE DEVELOPEMENT

This paper presents our on-going development in this arising territory of cloud conceptualization of fixed work having or creates SAKSHAM utilizing SEWAK and researches how organizations can best arrangement with the test of setting mindful cloud selection and improvement. The cloud "makes it easier and cheaper than ever for anyone anywhere to be an entrepreneur and to have access to all the best infrastructure of innovation."

- Software building is characterized as a procedure of investigating client necessities and afterward planning, building, and testing programming application which will fulfil those prerequisites.
- Complexities of software projects expanded at whatever point its equipment ability expanded. Demand for new software expanded quicker contrasted with the capacity with creates new software.

3. OBJECTIVE OF THE STUDY

- The engineers ought to liaise with the clients to figure out what issue the product is expected to explain or what work it is proposed to help.
- They should likewise gather data on the server for smart ups developments in which the framework is planned to maintain client-based software development of products integration, how it identifies with some other frameworks and its client populace.
- The item improvement system, for instance, object-arranged unforeseen development, CASE mechanical assemblies, etc. Furthermore, a creating criticalness of programming quality organization and the

assignment of significant worth the board strategies from collecting can be viewed.

4. REVIEW OF THE RELATED WORK

- The researched by **(Mouratidis, Islam, Kalloniatis, and Gritzalis, 2013; Hsu, Ray, and Li-Hsieh, 2014). [1]** The cloud organization models are shipped off customers through four principal transport models reliant on required a mannered set of clients, protection and insurance needs. These cloud organization movement they associate the components, characterize the parts, lastly, and execute the representative model to create a diagram that should show the very sort of conduct that was proven in the notorious mode for private and public cloud.
- In the present study for cloud development to the world, a degree is not at this point an assurance of employability not at all like many years prior while joining up with practically any degree program guarantees a stock structures of cloud concept produce conduct that is direct, illustrative, remarkable, objective chasing concurrent, strategic, or sinusoidal. These fundamental exercises, understudies at that point consolidated these capacity structures to assemble models to concentrate more complex elements see **Fallows and Steven; 2000, Warn and Tranter, 2001; Cox and King, 2006). [2]**
- As introduced for employability limits infer limits, perspectives, MSME immediate, other than explicit cutoff, to draw in a person to interface with and advance in the diligently changing requesting of the work setting **(CBC, 2000; Buck and Barrick, 1987; Gregson and Bettis, 1991) [3,4]** and to stay as a resource for directors These are limits that cut across all circumstances from portion level to CEO. Clouds don't have a reasonable and complete definition in the writing yet, which is a significant assignment that will assist with deciding the zones of research and investigate new application areas for the use of the Clouds.

4.1 FUZZY LOGIC

Fuzzy Logic is fundamentally a multi-esteemed rationale that permits middle of the road esteems to be characterized between regular assessments like yes/no, valid/bogus, dark/white, and so forth

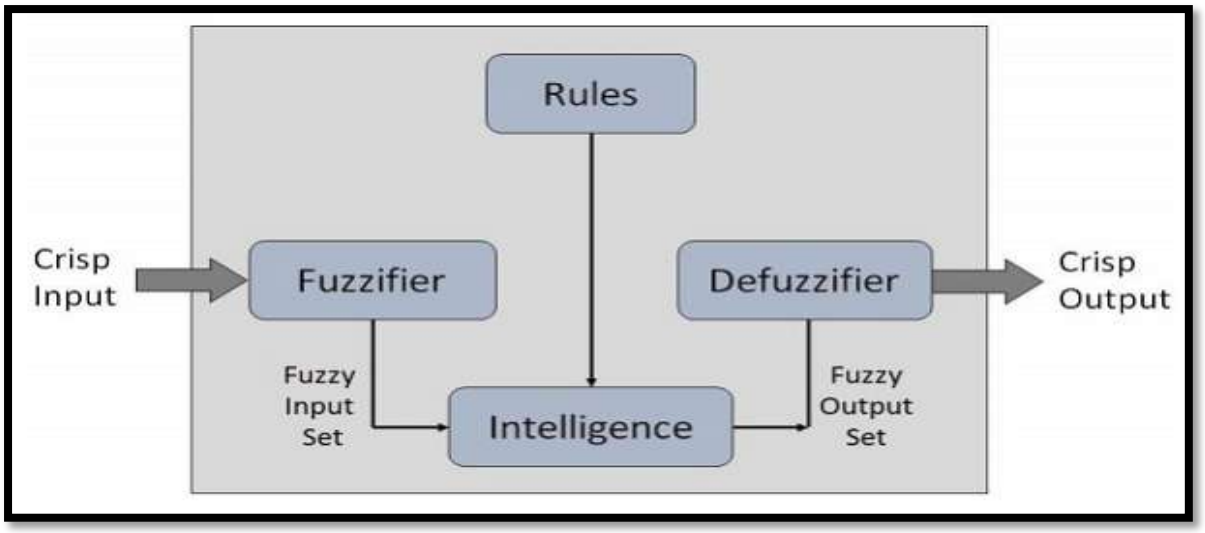

Figure 1 Fuzzy Logic

5. TYPES OF CLOUD COMPUTING

A. SOFTWARE AS A SERVICE (SAAS)

In the product on request SaaS model, supplier closes clients arrange reliant on a particular duplicate transport. Subordinate upon the association level getting (SLA), the client\'s data for each model may be administered locally. There are SaaS applications for head business kinds of progress, for instance, email, bargains the board, cash related collusion, client relationship the executives (CRM), human asset the board (HRM), charging and joint exertion.

B. PLATFORM AS A SERVICE (PAAS)

PaaS is a finished unexpected turn of events and affiliation pass on fundamental cloud-based applications to front line, cloud-drew in attempted applications master relationship on pay even more similarly as costs arise reason and access them over a made sure about Web connection. Like IaaS, PaaS joins establishment—workers, accumulating and frameworks organization—yet moreover middleware, headway mechanical assemblies, business information (BI) organizations, data set the board systems and that\'s simply the start.

C. INFRASTRUCTURE AS A SERVICE (IAAS)

IaaS is a sort of appropriated figuring model that apportions virtualized enrolling resources for the customer through the web. IaaS is one of the major pieces of circulated registering nearby. Infrastructure as a service (IaaS) is such an appropriated figuring model allocates virtualized enlisting assets for client through the source of internet. IaaS is important of the significant bits of

circled enrolling close by SaaS and PaaS. IaaS is totally regulated on web.

6. CONCLUSION

This Article a contention has been made for the significance of implanting the cloud computing to developed manufacturing smart-ups and cloud base system for developing new units of ambitious manufacturing source to create SEWAK in field of SAKSHAM cloud development for better instrument to cloud server to manage a huge database of the dynamic range in this research project in conclusion of MSME and their idea of start-ups in small scale to high scale complex fuzzy and generic system for auxiliary systems in private and public cloud computing and this resize of learning SEWAK for proficiency and exploration proof have been introduced that symbols used to make models were presented just as model Cloud concept model-building situations that are remembered for some optional polynomial IOT System. With the help of soft computing of quality assessment many companies improve their cloud base server management system in quality of productivity, increase reliability. By implementation of the project in real world more time to produces many software products and save time, cost and reduce efforts.

REFERENCES

1. Buck, L. L., & Barrick, R. K. (1987). They're trained, but are they employable? Vocational Education Journal, 62(5), 29-31.
2. Fallows, S., & Steven, C. (2000). Building employability skills into the higher education curriculum: a university-wide initiative. Education+ training, 42(2), 75-83.
3. Gregson, J. A., & Bettis, P. J. (1991). Secondary Trade and Industrial Education Work Values Instruction: Emancipators or indoctrination? A paper presented at the American Vocational Association Convention. Los Angeles, CA
4. Mouratidis, H., Islam, S., Kalloniatis, C., & Gritzalis, S. (2013). A framework to support selection of cloud providers based on security and privacy requirements. Journal of Systems and Software, 86(9), 2276–2293. https://doi.org/10.1016/j.jss.2013.03.011

DIGITAL SIGNAL PROCESSING BASED ELECTRICAL BRAIN ACTIVITY: A STUDY

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Abstract- Regardless of those various illustrations about expectant cognitive techniques during micro What's more macro levels for a number creature species, those thought that expectation for particular expressions assumes an essential analytics part clinched alongside ongoing dialect preparing need been combative. Here we misused an phonological normality of English uncertain articles (‘an’ precedes nouns starting for vowel sounds, inasmuch as ‘a’ precedes nouns start for consonant sounds) for mix for event-related cerebrum possibility recordings starting with the human scalp with hint at that readers’ brains camwood pre-activate distinct expressions previously, a graded style to An level that camwood a chance to be assessed starting with the likelihood that every expressions may be provided for similarly as an continuation for an sentence part logged off.

1. INTRODUCTION

In spite of those assortment from claiming continuous-handling domains over those phylogenetic spectrum in which expectant transforming need been watched (at both micro and macro levels), the idea about expectation need assumed a moderately minor part for dialect preparing hypotheses. Mankind's dialects the table boundless possibilities not main for saying new things as well as to stating of age things on new ways fare as well huge numbers ways, exactly bring argued, on settle on prediction of expressions a feasible and successful system but when relevant demand may be curiously high. Accordingly, initial dialect processing models frequently all the included a few form of memory support wherein sentential components were temporarily put away to after the fact coordination toward phrasal, clausal alternately sentence boundaries. Since the 1970s, however, the agreement see need been that sentence transforming is constant Also incremental, with temporary commitments constructed that in any event temporarily intention semantic ambiguities.

Similarly as each word will be transformed upon its event furthermore quickly coordinated circuit under the sentence representation. That's only the tip of the iceberg recently, a couple scientists bring contended to those predictive force of connection for generating expectancies Throughout sentence processing, At it need turned out was troublesome should recognize prediction starting with combination. What a portion analysts make Likewise proof for neural pre-activation (prediction, toward a mental level), others detract Likewise a sign of the straightforwardness alternately challenge over coordinating expressions under message-level representations upon, be that not before, their event. An for example will be the N400 part watched on event-related mind possibility (ERP) studies, done which cortical neuronal ensembles produce potentials measurable during the scalp.

The N400 (B200–500 ms post–item onset) may be those brain's neural light of at whatever conceivably serious thing. It's plenty fullness may be touchy should saying frequency, tedious Furthermore concreteness, around other elements. Those N400 will be particularly substantial should nouns that don't meaningfully fit with their first contexts. However, N400s also describe reactions should everything accept those the majority exceedingly normal nouns, significantly the point when they fit contextually, for amplitudes conversely related with their logged off cloze probabilities. An item's cloze likelihood may be those rate of people that keep on going a sentence part for that thing for a logged off sentence fruition errand.

2. RESULTS

We got logged off probabilities to the sum article Also thing focuses. Members were approached should provide those best continuations for penalties truncated preceding the article or thing. Article cloze went starting with 0–96%; thing cloze went starting with 0–100%. These wide ranges about anticipation permitted to examination of the correlations the middle of those ERP impacts and the logged off probabilities of the applicable continuations. In the ERP experiment, separate members read penalties for fluctuating relevant demand that incorporated target articles What's more nouns with vast ranges about cloze.

Over members those same sentence connection showed up for both higher what's more lower-probability articles what's more nouns. Notably, In spite of some continuations were that's only the tip of the iceberg possible over others, none might have been

nonsensical, excepting members starting with Creating a method (conscious or unconscious) whereby an doubtful article might have been made should indicator a looming semantic aberrance.

The 160 articles and nouns were sort program under ten equal-width bins as An capacity from claiming every item's cloze probability, from most elevated (90–100%) to least (0–10%). ERPs for every 10%bin were averaged 1st within, afterward across, members. Receptacle might have been afterward computed and associated with mean ERP plenty fullness in the N400 chance window (200–500 ms) for articles and nouns independently. Connection coefficients (R-values) furthermore rate of difference demonstrated Eventually Tom's perusing logged off likelihood (r2) was then ascertained independently for the greater part 26 cathode locales.

3. DISCUSSION

Toward constructing sentence contexts that prompted changing logged off desires for nouns start for vowel or consonant sounds, we Might assess the degree should which such desires were structured internet Eventually Tom's perusing first the thing for those phonologically suitable uncertain article alternately alternate semantically identical, sentential compatible Anyway phonologically unseemly person. Comparable of the nouns, he's only the tip of the iceberg contextually unforeseen an uncertain article was, the more negative the ERP mean plenty fullness between 200–500 ms post-word onset (N400). Clinched alongside other words, that brain's light of those articles differed previously, a graded style likewise a capacity of relevant demand.

Our comes about Along these lines show not main that followers could rapidly, incrementally incorporate approaching expressions under evolving mental sentence representations, Be that that they do along these lines to a limited extent Eventually Tom's perusing exploiting different compelling drives to structure probabilistic predictions from claiming which particular expressions will originate following. Here, we plainly demonstrated this to those target articles also nouns, In spite of we need no motivation behind will expect the same might not hold for each expressions for an sentence all around the go from claiming typical perusing rates. Notably, most extreme correlations to both nouns Furthermore articles were not haphazardly dispersed crosswise over those scalp Anyway instead bunched over Centro parietal scalp destinations the place past perusing investigations

need demonstrated those biggest N400 impacts.

4. METHODS

4.1 Experimental Design and Materials

Volunteers were tried over a single session, for visual penalties introduced centrally, you quit offering on that one expression at once (200-ms duration, 500-ms boost onset asynchrony). Those guidelines were with peruse penalties to cognizance What's more address yes/no cognizance inquiries Eventually Tom's perusing pressing hand-held buttons. The electroencephalogram (EEG) might have been recorded from electrodes orchestrated geodetically to an Electro-cap, each referenced internet of the cleared out mastoid. Squints Furthermore eye developments were monitored starting with electrodes put on the external canthi also under each eye, referenced of the exited mastoid. Cathode impedances were held beneath 5 ko. The eel might have been amplified for Grass amplifiers for a band pass about 0. 01 with 100 Hz ceaselessly digitized at an examining rate about 250 Hz.

4.2 Participants

Thirty-two volunteers (23 women) participated in the ERP experiment for course credit or for cash. All were right-handed, native English speakers with normal or corrected-to-normal vision, between 18–37 years (mean, 21 years). Seven participants reported a left-handed parent or sibling.

4.3 Procedure

Volunteers were tested in a single session, with visual sentences presented centrally, one word at a time (200-ms duration, 500-ms stimulus onset asynchrony). The instructions were to read sentences for comprehension and answer yes/no comprehension questions by pressing hand-held buttons. The electroencephalogram (EEG) was recorded from 26 electrodes arranged geodetically in an Electro-cap, each referenced online to the left mastoid. Blinks and eye movements were monitored from electrodes placed on the outer canthi and under each eye, referenced to the left mastoid. Electrode impedances were kept below 5 KO. The EEG was amplified with Grass amplifiers with a band pass of 0.01 to 100 Hz, continuously digitized at a sampling rate of 250 Hz.

5. DATA ANALYSIS

Trials contaminated by eye movements, excessive muscle activity or amplifier blocking were rejected offline before averaging; on average, 10.7% of article trials and 11.4% of noun trials were rejected. Data with excessive blinks were corrected using a spatial filter algorithm. A digital band-pass

filter set from 0.2 to 15 Hz was used on all data to reduce high-frequency noise. Data were re-referenced offline to the algebraic sum of left and right mastoids and averaged for each experimental condition, time-locked to the target article and noun onsets.

REFERENCES

1. Stanovich, K.E. & West, R.F. Mechanisms of sentence context effects in reading: automatic activation and conscious attention. Mem. Cog nit. 7, 77–85 (1979).
2. Kintsch, W. & van Dijk, T.A. Towards a model of text comprehension and production. Psychol. Rev. 85, 363–394 (1978).
3. Carroll, J. & Bever, T. Sentence comprehension: a case study in the relation of knowledge and perception. In Handbook of Perception, Vol. 7 (eds. Carteret, E. & Friedman, M.) 299–317 (Academic, New York, 1978).
4. Just, M.A. & Carpenter, P.A. A theory of reading: From eye fixations to comprehension. Psychol. Rev. 87, 329–354 (1980).
5. Daneman, M. & Carpenter, P.A. Individual differences in integrating information between and within sentences. J. Exp. Psychol. Learn. Mem. Cong. 9, 561–584 (1983).
6. Mitchell, D.C. & Green, D.W. The effects of context and content on immediate processing in reading. Q. J. Exp. Psychol. 30, 609–636 (1978).
7. Marslen-Wilson, W.D. Sentence perception as an interactive parallel process. Science 189, 226–228 (1975).
8. Altmann, G.T.M. &Stedman, M.J. Interaction with context during human sentence processing. Cognition 30, 191–238 (1988).
9. Pickering, M.J. Processing local and unbounded dependencies: a unified account. J. Psycholinguist. Res. 23, 323–352 (1994).
10. Tyler, L.K. & Marslen-Wilson, W.D. The on-line effects of semantic context on syntactic processing. J. Verb. Learn. Verb. Behav. 16, 683–692 (1977).

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INDUSTRIAL ELECTRICAL DEVICE REMOTE PLACES USING GSM

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ABSTRACT:

In this paper, we have tried to increase the level of security system by combining new techniques and added new concepts to develop low cost GSM based industrial security system. In our day to day life or in industrial purpose security and automation is a prime concern. Industrial automation and security system design is growing nowadays. The designing of this security system is simple hardware circuit. It allows every users to use this wireless security system by using or combining IR sensor, gas sensor, fire sensor and main failure detector at industrial level.

Keywords: IOT (Internet of things), IR sensor, GSM module.

1. INTRODUCTION

Home security is the most significant one for every homeowner either in an individual house or an apartment. To get the absolute peace of mind whether you are at home or out of home you must ensure that your home is installed with the perfect home security monitoring system. This GSM Bases industrial security system can be used to provide security system for residential, industrial, and for all domestic and commercial purposes using GSM technique. Security systems are certain electronic devices which are used to detect intrusions in home or industry. The basic components of a home automation security system are motion detectors, LPG detectors and smoke detector. It is cheaper and can be maintained easily than any other security device. When the user is away from home or industry, all the sensors are activated by switching on the Security system. Whenever systems experiences a abnormal condition in the industry like any fire/smoke occurs in the home/industry and any intrusion into the home/industry the Security system alerts the security personnel as well as the owner of the industry by sending SMS alerts to the users of the home/industry. In the system along with security, industrial lighting is also activates based on the lighting available in the industry. The system operates with the help of sensors installed in this system. Security is the main concern for every industry. Every industry wants to work in safe and secured environment that are beneficial for the workers and specially for their production process say for raw materials in the industry. Every industry want their workers to keep safe and secured from various incidents like accidents caused due to LPG gas leakage or accidents due to fire

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in their go down or their machinery department.

2. RELATED STUDY

Now a days the usage of gases and fuels at home and in industries has increased, So the number of accidents that occur as a result also increases. “A year ago in Visakhapatnam, Andhra Pradesh, there was one of its worst environmental disasters – the contamination of poison gas from a storage tank of LG Polymers Ltd, a South Korean company on the outskirts of the city, killed 12 people and taken to the hospital nearly 500 – villagers residing near the plant remain fearful. Though the plant has since been closed due to orders from the Andhra Pradesh high court, residents of Venkatapuram and four other villages surrounding the plant say the horror of the tragic incident haunts them to this day.” [1] Not only in venkatapuram we have also seen the Bhopal disaster, Chernobyl gas tragedy, which cost the whole area with effected air which contains harmful gas, people at that place get effected with harmful diseases and radiation. “There are approximately 20 gas disasters happened across various divisions of industries in India from 2014-2021, till date.” [2] 1.1 Scope While LPG is a necessity in every sector, its leakage might be disastrous. There are a variety of products available to detect gas leaks and prevent any mishaps. We've created an LPG gas detection alarm using Arduino. If a gas leak occurs, this system detects it and sounds an alarm by buzzing the circuit's buzzer. This system is simple to construct, and anyone can handle it. To detect danger, we used an LPG gas sensor module and a smoke sensor module. When LPG gas leaks, it sends a HIGH pulse to Arduino's DO pin, which Arduino reads continually. When the Arduino receives a HIGH pulse from the Gas module, it displays the message "Leakage Alert" on a 16x2 LCD and triggers the buzzer, which sounds repeatedly until the gas detector module detects no gas in the surroundings. When the gas detector module sends a LOW signal to Arduino, the LCD displays the message "No LPG Gas Leakage."

EXISTING SYSTEM:

Devices that require invasive connections in order to obtain measurements. An Arduino-based system for detecting gas leaks exists. However, it only activates the alarm if it detects a gas leak. If the user is not at home, this would be an issue. As a result, the current system is inadequate.

The disadvantages of the existing manual approach are as follows:

The systems are not portable. If the user is not at home, this would be an issue. Difficult to operate complex system. Code that is difficult to read. Code that is inaccurate

3. AN OVERVIEW OF PROPOSED SYSTEM

This project detects if any worker is entering inside the department or not. If some workers enters the working chamber or machinery room the lights will be on and if no one is present in the working room the lights will be off. If there is no one in the working chamber or in the plant then in that case if the lights or halogen bulb near the convey or belt or the boiler is continuously on so this wastage of electricity will cost heavy bills for the company. By using this system the

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wastage part can be easily overcome and more important than that this circuit is wireless and automatic on off lights so need for manual working for switching off the lights every time.

It uses LPG gas sensor to detect the gas leakage. If there is leakage then buzzer is turned on. Specially in the cooking gas industry they have to be very careful with whatever their are working or designing. Because there are thousands of pipes that bypass the LPG gases from inlet of pipe to another outlet of pipe. If there is leakage in the pipe due to any reasons in the night time or any time there might be chances of getting major incidents of end of workers. This system can protect the workers all damages. Sending of data will be there if the gas is leakage on the registered mobile number.

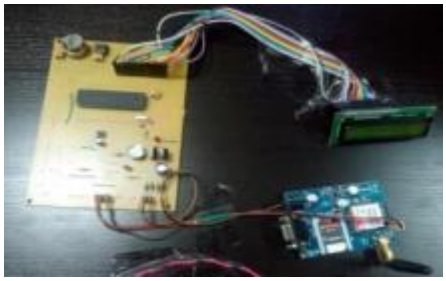

Fig.1. Hardware module.

It uses the fire sensor for detection of fire in the industry or say go down or gas filling chamber. If the fire is detected then in that case the fire detection sensor will sense and will on the water sprayer pump working as fire extinguisher and when the fire is extinguished automatically the water sprayer pump will be off. No need for manual switching on and off of the circuit. It will work automatically.

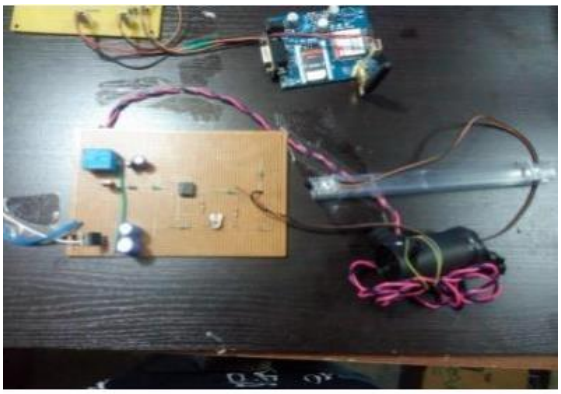

Fig.2. Sensor interfacing.

4. CONCLUSION

In this paper presentation the gas detection and alerting system will be done through SMS. The fire extinguisher circuit called as automatic fire sprayed on fire detection pump on and when fire extinguishers the pump will of. Automatic lights on-off system through invisible rays is also installed.

REFERENCES

[1] P. Satya, Ravi Teja, A. Sai Srikar, V. Kushal and K. Srinivasan. "Photosensitive Security System for theft detection and control using GSM technology". National institute of Technology, Trichy, India.SPACES-2015.

[2] Arbab Waheed Ahmad, Neem Jan, Saeed Iqbal and Chankil Lee. “Implementation of ZigBee-GSM based home security monitoring and remote control system”. Research assistant , Hanyang university, Ansan, Korea. 978-61284-857 IEEE 2011

[3] A Alheraish. “Design and Implementation of home automation system”. King saud university, Riyadh, Saudi Arabia 00983063 IEEE 2004.

[4] Rozita Teymourzadeh, Salah Addin Ahmed, Kok wai chan and Mok vee hong. “Smart GSM based home automation

system". Faculty of Engineering Technology and Built environment UCSI university.

[5] T. Murugan, Azha Periasamy, S. Murugananad. "Embedded based industrial temperature monitoring system using GSM". International Journal of Computer Applications (0975-8887) volume 58-No. 19, November 2012.

[6] R. Anandan, B. Karthik, Dr.T.V.U. kiran Kumar . "Wireless home and industrial automation security system using GSM". Journal of global research in computer science. Volume 4, No.4, April 2013.

[7] M.Sravan Kumar, M. Mounika, L. Ramya Pavani, E. Ranadeep, B.Siddhartha, K.B.V.S.R. Subramanyam. "GSM based industrial security system". ISSN(PRINT):2393-8374, (ONLINE):2394- 0697, VOLUME-2, ISSUE-5, 2015

[8] Onengiye M. Georgewill, Chukwunazo J. Ezeofor. "Design and implementation of SMS-based industrial/homes gas leakage monitoring and detection alarm System". International Journal of Engineering Trends and Technology (IJETT)-Volume 35 Number 9-May 2016.

[9] Kashmira Thul, Priti Dhote, Ashwini Chokole, Samir Raipurkar. "GSM based industrial security system". International Journal of Innovations in Engineering and Science, e-ISSN:2456-3463 Vol.2 No.4, 2017.

[10] E. Isa and N Sklavos. "Smart home automation:GSM security system design and implementation". Journal of Engineering Science and Technology Review 10(3)(2017) 170-174.

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INNOVATIVE PRODUCTION OF TREES IN NURSERY FROM THEFTS USING RFID AND SENSOR

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ABSTRACT:

This paper presents a model of preventing smuggling of valuable trees like sandal trees, red sandal trees in the forest area. In proposed system in order to detect cutting down of valuable trees immediately, we use vibration sensors and continuity sensors. Here vibration sensor is used to sense the vibration created during cutting down the tree and continuity sensor is used to check the continuity between neighbouring trees. In existing system, RFID is used to identify the missing tags in the tree. This system proposes an intelligent system to track the detection of illegal smuggling of trees in forest. Existing system makes use of various technologies such as RFID, Wifi etc,. RFID based systems lack in rain if passive taxes are used or lack in cost effectiveness. Similarly, wifi based systems becomes costlier and require constant network connection. Hence this project proposes a wifi based tracking system. The stationary wifi transceiver consists of ESP8266 with Arduino Uno development board which detects the mobile transceiver. The mobile transceiver detects mobile transceivers under its vicinity and sends the data to other stationary transceiver and ultimately the data stored in data base

Keywords: RFID Reader, ESP8266, wifi.

1. INTRODUCTION:

Forest constitute approximately 30% of the global land area. They provide habitat for both humans and some species that share the valuable eco systems goods. Managing a forest has become an extremely hard task . Illegal logging represents one of the biggest challenges of forests sustainability. Smuggling of sandalwood has created socio economic and law and oeder problems in area bordering in India. Trees which are mostly affected include sandal wood, teakwood and rosewood. The most promising resolution is – "Protection of valuable trees from smuggling using RFID and sensors" which will be a robust, valuable ans realistic technology for monitoring. A SMART automated unit has been thus devised to tackle these issues. The combination of latest wireless communication systems and Embedded solutions offer us such modules. Each tree should have one little Embedded system- unit with: sensors and RFID tags. The nearness of above said parts will send the current state of the tree to the server , utilizing wifi module . The information sent is as information string|\outline by means of Internet , henceforth IoT organize is shaped here . The information outline is deciphered by the BLYNK APP which keeps up the data of every such single tree. Forests constitute approximately 30 % of the global land area.

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They provide habitat for both humans and some species that share the valuable ecosystem's goods. Managing a forest has become an extremely hard task. Illegal logging represents one of the biggest challenges of forests sustainability. According to the UN Framework Convention on Climate Change (UNFCCC), there is more carbon stored in the forests than there is in the Earth's atmosphere–some 638 billion metric tons as of 2005. In addition, it is estimated that deforestation accounts between 1/6 and 1/4 of global carbon emissions. These percentages and figures are definitely reflecting how serious the phenomena of deforestation is, it also urges people around the world that have some knowledge and understanding of the consequences to think about solutions or ways to prevent illegal logging. Forestry departments in many countries such as Brazil and Malaysia thought of digitizing trees and hence transforming forest management to a high tech process using RFID tags. RFID (radio frequency identification) systems usually consist of a microchip, antenna, and it can store up to 2 kilobytes of data. There are 3 types of RFID tags. They are active, semi active and passive. Active and semi active RFID tags are power sources by an internal battery to power their circuit. An active tag use the internal battery to broadcast the signal to reader, the broadcasted frequency in this case can reach 950 Hz and be read 30 meters away. If more batteries are added into the tag, the broadcasting will be boosted and the distance could reach 100 meters in the case of a semi active RFID tag, broadcasting relies on the reader, which means that the reader supplies its power for broadcasting. The other type is passive tags.

2. LITERATURE SURVEY

[1] IOT Based Anti-Poaching Alarm System for trees in Forest using Wireless Sensor Networks: In this paper a system which can be used to restrict smuggling. The design system uses three sensors tilt sensor, temperature sensor, sound sensor. Data generated from these sensors is continuously monitored with the aid of Blynk App. With respect to the sensors, their output devices are activated through relay switch. For tilt sensor and sound sensor a buzzer is activated and for temperature sensor a water pump is activated. Generated data is stored in Blynk Server over the Wi-Fi module. Forest officials are notified when any event occurs so that appropriate action can be taken.

[2] Design of a WSN node forest trees against poaching: This paper propose a microcontroller based antipoaching system employing WSN technology, which is capable of detecting theft by monitoring the vibrations produced by the cutting of trees/ branches using a 3 axis MEMS accelerometer. WSN is widely used technology in remote monitoring applications. Due to nature disaster some trees may fallen and create some sounds for that purpose they are using GPS module for continuous monitoring of trees location.

[3] Forest Monitoring System Using Wireless Sensor Network: This project presents a system for monitoring forest and its vicinity based on IOT based wireless sensor network technology. This system need to be able to accurately monitor forest cover and quality is crucial to understanding the costs of deforestation. This project is an attempt to prevent forest mishaps, the intrusion of animals in the surrounding forest areas, illegal activities in the forest by using wireless sensor technology and eliminating manual power t the highest possible extent.

3. METHODOLOGY

The proposed system is made up of sensors and RFID along with wifi module technology.

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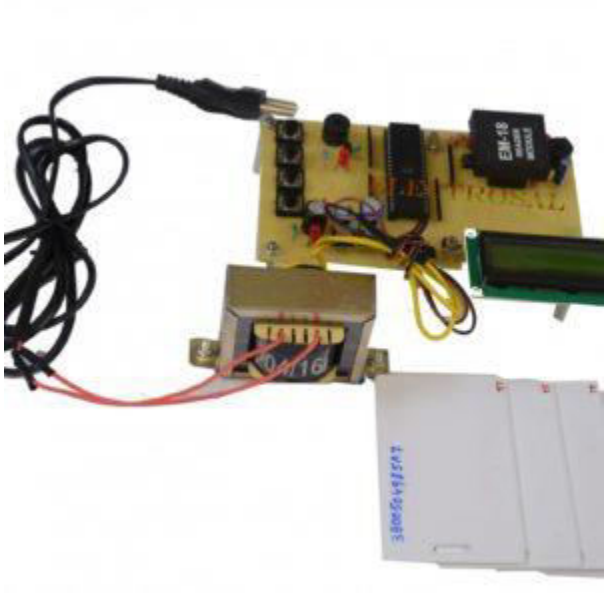
Metal sensor, flame sensor, vibration sensor are the primary sensor used in the system. The flame sensor is used in the board to detect the wild fire and intimates the same to the concerned authority through blynk application. The vibration in any tree is detected by vibration sensors and metal detector detects and alerts when the tree is touched by a metal. In all the cases, the position of the tree is sent to the concerned authority through SMS/email. The android app can be developed to display the received data.

Operation:

The proposed system consists three sub-sections namely tree unit, sub-server and forest officer unit. Sensor which is fitted on tree is tree unit, control section consisting sub-server unit and finally the forest officer mobile phone or personal computer is the forest officer unit. Tree unit consists of vibration sensor, continuity checker and zigbee. Sensor is a device which is able to transform physical readings collected from environment into signals that can be measured by a system. In our system, vibration sensor is used to detect the vibration level of tree. If any person tries to cut the particular tree, then the vibration level of tree will be high. The vibration sensor triggers the microcontroller while its value exceeds its threshold value. Continuity checker is used to link all the trees in a network. If the tree is cut down without any vibration then we are able to find out it with this continuity checker. The tree unit is fitted in many trees and continuously monitoring the status of sensor, and if any events (tree cut) occurs then one or all of these system detect this and then wirelessly sends this to sub-server unit. In our proposed system, zigbee is used to send information wirelessly.



The result obtained is shown in bylnk app. The results obtained show fire detection, vibration detection , deforestation and illegal movement in the forest area and display on the users phone. Hence this project will help to over come the problem and protect the forest. The summary of the proposed system is to protect the trees from smuggling and to protect the forest from the fire. By this method the deforestation can be reduced and enable the forestation. The main goal of the system is to enhance forest management efficiency and decrease trees logging cases. Thus , from implementation of this project eco system is maintained balanced.

CONCLUSION

The theory was completed to abstain from carrying of valuable trees in secured zone in woods. There are numerous approaches to secure trees yet here is a brilliant technique for interfacing a few sensors around trees with a iot device was done. Through each tree as a smart tree and bringing numerous such trees under a system. The structure we are making in the backwoods where the tree are exorbitant

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and their security is basic reality. Here we are given such sort of system.

Future Scope:

The system monitors when the tree logging occurs, the sound generated due to axing the tree is sensed by the sound sensor. Also if the tree bends, the buzzer is activated. And if in case forest fires, when the temperature of the surroundings increases its sensed by the temperature of the surroundings increases its sensed by the temperature sensor, through the relay switch the water pump is turned on. Then this generated data is send to the forest officer if any event occurs so that appropriate action can be taken.

REFERANCES

[1] 'Hameem C Hamza' "Tree Theft Control System" 2013 Texas Instruments India Educators Conference.

[2] 'Ghousia Sultana B' "IOT Based Anti-Poaching Alarm System for Trees in Forest using Wireless Sensor Network" Volume 9, Special Issue No. 3, May 2018.

[3] 'Subhashini A' "Smuggling preventions system for trees in forest using IOT" Chennai International journal of scientific research and innovations IX (2018) 15-22.

[4] 'Mr V. Narasimman Asst.Prof" "Design of a WSN node for forest trees against poaching".

[5] 'B S Sudha Yogitha' "Forest monitoring system using Wireless Sensor Network" Volume 4, Issue 4 April-2018.

[6] 'Mr Rohan Solarpurkar' "Real Time Forest Anti-Smuggling Monitoring System based on IOT using GSM" International Journal for Research in Engineering Application & Management (IJREAM) ISSN: 2454-9150 Special Issue- ICSGUPSTM 2018.

[7] 'Prof. Mhaske D.A' "Anti-smuggling System for Trees in Forest using Flex Sensor with Gsm & Zigbee Network" International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue 4, April 2016.

[8] 'Narhari R. Kotkar M.E (ESD AND VLSI)' "Anti-Smuggling System for Trees in Forest using Flex Sensor and Zigbee" International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 3, Issue 9, September 2014.

[9] 'B S Sudha' "Forest Monitoring System Using Wireless Sensor Network". E-ISSN: 2454-8006 Volume 4, Issue 4 April-2018.

[10] 'Ankita Dalvi' "Undetected Detective to protect the Forest Trees Against Poaching Using WSN Technology" Vol. 3, No.6, 2018.

[11] 'Smita Gaikwad' "Design WSN Node for Protection of Forest Trees Against Poaching based on Zigbee".

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INTELLIGENT WASTE MANAGEMENT SYSTEM IN SMART CITIES BASED ON IOT

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ABSTRACT:
The uncollected waste material when the waste bin is full is a common problem nowadays. Thus, an efficient waste management for the waste material is essential in ensuring a clean and green surrounding environment. This paper presents an Internet of Things (IoT) based Smart Waste Collection Monitoring and Alert System to monitor the waste material at the selected site of garbage collection area. The system is implemented using an ultrasonic sensor which is connected to Arduino UNO as to monitor waste bin garbage level. In this system, waste bin depth level will be sent via Arduino Ethernet Shield with an Internet connection to the Ubidots IoT Cloud. The Ubidots store the collected waste bin level data into IoT database and display the waste bin depth level on online dashboard for real-time visualization. The Ubidots Event manager invokes a notification alert to garbage collector mobile phone via a SMS when the waste bin is nearly filled for immediate waste collection. Therefore, the waste collection became more effective and systematic.

Keywords: IOT , GSM, GPS, LCD.

1. INTRODUCTION:

At present, most of the cities around the world require challenging solutions for solid waste management, as there is rapid growth in residential areas and the economy. Municipal authorities have inadequate resources for waste management institutions to effectively collect the waste generated. It becomes an excessive wastage of resources when bins are collected that are filled up partially. The IoT based garbage monitoring system is a very innovative system which will help to keep the environment and cities clean. This system monitors the garbage bins throughout the city and informs about the level of garbage collected in the garbage bins to a person in the administrative department. For number of times we have seen that the dustbins are being overflown with the waste materials and the concern person don't have any information about it within the time, due to which unsanitary conditions are formed in the surroundings environment and living area. Bad smell is out due to waste in dustbin at the same time. Also, the bad look of the city which leads to air and environmental pollution and to some harmful infections and diseases around the locality which is spreadable easily. There are number of unwanted manual checks of garbage bin's level by municipal corporations which is less effective and time consuming. Trucks are sent to empty the

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dustbins whether they are full or not. And the trucks need fuel which is costly. Several sensing methods have been integrated and have combined their verdicts that offer the detection of bin condition and its parameter measurement. Though results and developed algorithms are efficient for automatic bin status monitoring work lacks remote monitoring of bin. So, in this paper we have proposed system which can be deployed in general purpose dust bins placed at public places and which allows us to monitor its status remotely over web browser for efficient waste management. Due to drastic increase in economic and population growth in the nation there is huge development in the generation of the solid waste. Solid waste management is a main problem of surroundings in the whole globe. SWM is a huge problem not only in urban cities of India but in most of the nations in the globe. There is a requirement to evolve an effective system which will resolve this issue or decrease it to some level. It will support them to maintain their surroundings green and clean in an effective way. Today each government across the world is scheduling to construct smart cities or attempt to change the cities into smart cities. A smart city is a city which is constructed on smart integration of activities and endowments of independent, aware and self-decisive citizens. The solid waste collection in a smart city is an essential part for surroundings and its effect on society must be regarded seriously. By offering a whole internet of things based system the process of collecting, tracking and handling the solid waste can be monitored and automated easily and effectively(Chaudhari and Bhole, 2018; Ramesh et al, 2018; Sharma and Singh, 2018). Pokalekar et al (2018) has stated that internet of things can be described as a physical object networking with the use of embedded software and electronic sensors that permits the devices to receive and send information from each other. The internet of things carries out collection of data, sensing, storing data and processing by linking physical devices to internet. Surapaneni et al (2018) has stated that the municipal corporations are wholly liable for proper management of waste in their respective cities in the context of India. But most of the authorities are not satisfying their duty to offer effective ways of handling the waste generation at source, transporting, collecting and waste disposal. Because of this ineffective waste collection, the collected waste is always integrated with excreta of animals and humans in the drains and liable for roads flooding during rains, breeding of insects and lastly resulting in spreading various diseases. Dilip et al (2018) internet of things SWM system is a creative way which will support to maintain the cities clean. This system supervises the bins of garbage and informs about the garbage collected in dustbin through a web page. For this the system utilizes ultrasonic sensors placed on the top of dustbin to sense the level of garbage and comparing it with depth of garbage bins continuously (Nithish et al, 2019). This system makes use of LCD screen, ARM microcontroller, RF transmitter and GSM module for sending the information. The LCD display is utilized to show the garbage collected level in dustbins in percentage form. Sherly et al (2018) has stated that the solid waste management system is produced every day and by 2025 it would increase rapidly and hence effective method and decisions must be taken in order to handle the waste. Kumar et al (2016) have led a method of handling waste in a wellmannered way. The internet of things based alert system is used to produce the alarm signal to municipal officers. Arduino UNO is interlinked with ultrasonic sensor to evaluate the garbage level of dustbin (Anwar et al, 2018). RFID is used to identity and verify dustbin. Android application is

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connected with web server for interaction from municipal officer to nearby truck vehicle to collect the garbage (Pawar et al, 2018). Several solutions have been used for waste management to make it efficient and smarter. Every waste bin is attached with ultrasonic sensor which predicts the level of waste of dustbin (Sharma et al, 2018). According to Ali et al (2018) the ultrasonic measures estimate the waste level by sending a sound wave at a particular frequency and listens the sound wave that is bounced (Rao et al, 2018). Moisture sensor predicts the waste content that is disposed into dustbin and segregates the waste stored relying on waste moisture content (Jadhao et al, 2018).

2. LITERATURE SURVEY

According to Patel and Patel (2016) Internet of things is defined as a network type to link anything with internet based on stipulated protocols through equipment's of information sensing to organize communication and information exchange to accomplish smart positioning, recognition, administration, tracing and monitoring.Levallois(2017) defined internet of things as an interlink of physical devices also known as smart devices and connected devices, construction and other items involved with software, electronics, actuators, network connectivity and sensors which develop these objects to exchange and collect data.

Arkko et al (2015) denotes internet of things as a trend where huge set of embedded tools use services of communication provided by the protocols of internet. Most of these devices always referred smart objects which are not operated by humans directly but occur as components in vehicles or buildings or are distributed in the surroundings.

Thaler et al (2015) defined internet of things as a worldwide infrastructure for information society developing advanced services by interlinking virtual and physical things based on evolving and existing interoperable ICT. Through the use of recognition, data processing, communication and capture capabilities the internet of things makes complete use of things to provide services to entire types of applications whilst assuring the privacy and security needs are satisfied. The internet of things can be understood as a vision with societal and technological suggestions.

According to GSM Association (2014) internet of things defines the use of intelligently linked systems and devices to leverage data collected by actuators and embedded sensors in machines and other physical devices. Internet of things is anticipated to spread rapidly in the upcoming years and this convergence will release new service dimension that develops customer's life quality and enterprises productivity. IEEE (2014) defines internet of things as an items network each involved with sensors which are linked to internet. Chebudie et al (2014) has mentioned that internet of things envisions a complex and self-designing network that interlinks things to internet through the use of standard protocols of communication. The interlinked things have virtual or physical representation in digital world, capability of actuation/sensing, and a feature of programmability and are identifiable distinctly. The representation comprises information involving the things status, identity, place or any other social, business and privately related data. The things provide services without or with intervention of humans through the use of distinct recognition, data communication capture and capability of actuation. The service is used

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through the use of intelligent interfaces and is made feasible anytime, anywhere and for anything considering security.

Hung (2017) has defined the IoT as dedicated physical objects network that comprises embedded technique to sense and interact or communicate with their external environment and internal states. The link of processes, personnel and assets enhance the seizure of events and information from which a firm can learn usage and behaviour react with preventive measures or transform or augment processes of business. The internet of things is a basic capability for the making of digital business. In the report of EY (2016) the internet of things explains the link of devices to internet using embedded sensors and software to interact, exchange and gather information with one another. The globe is wide open with internet of things providing an endless number of opportunities widely and links at work, at play and at home. Madakam et al (2015) defined IoT as a comprehensive and open network of intelligent events that have the capability to organize automatically, share data, resources and information, acting and reacting in face of circumstances and alterations in the surroundings.

3. METHODOLOGY

In this project methodology model takes the fundamental process activities of Project Plan, specification, Analysis, hardware and software Design, development, validation and represents them as separate process phases. Now, let us see the particulars of the various blocks of the hardware of an garbage monitoring system. As shown in Fig. the blocks are:

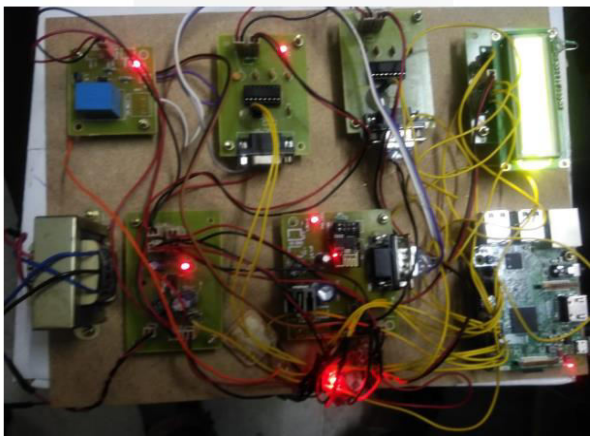

Fig.1. power supply connected.

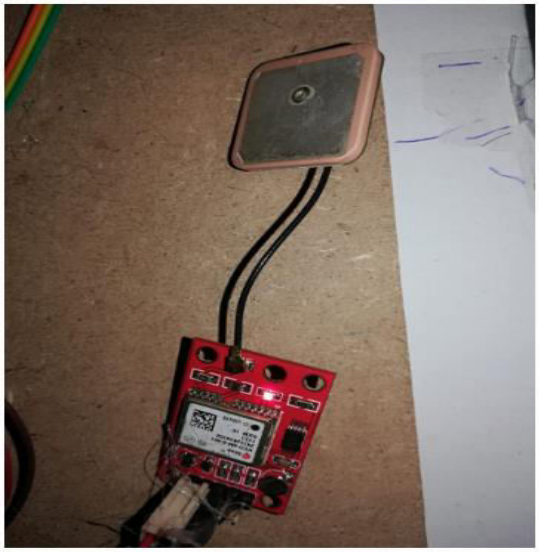

Fig.2. GPS module.

Here we are using WIFI module we get latitude and longitude values from predefined values in program.

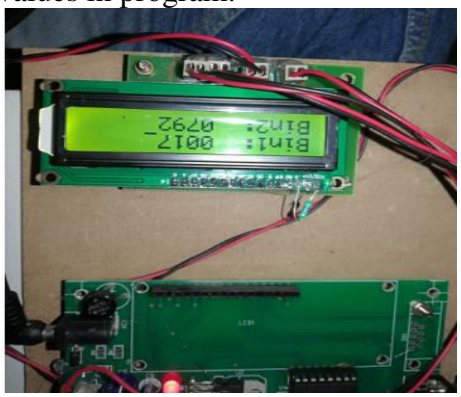

Fig.3. Dust bins status.

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OUTPUT RSULTS WITH LOCATION:

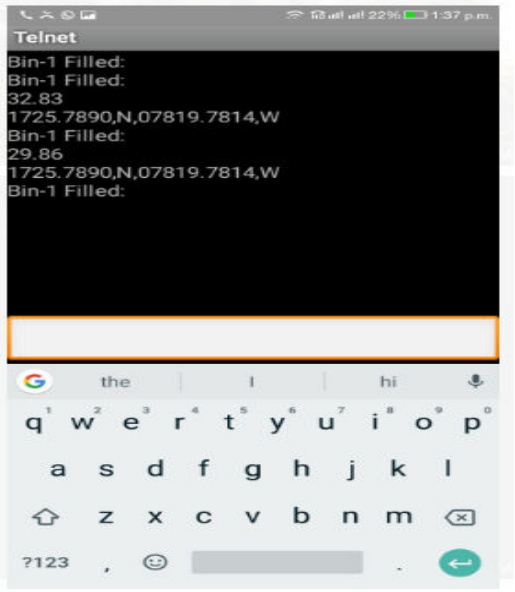

Fig.4. Out put results by using TELNET app.

CONCLUSION

In this project, we propose a new solution to enhance waste collection efficiently using the Arduino Uno with Arduino Ethernet Shield technology and ultrasonic sensor systems. In this proposed system, the garbage overflow of garbage can be avoided and managed efficiently. This will intimate or send SMS or email to the authorized person through Ubidots platform. The garbage managing system and the facility of collecting the garbage presently doesn't fit to the current requirement. Hence better facility of collecting garbage and transportation should be provided. Since, this system provides the information when the bin gets completely filled with garbage, it reduces the number of times the arrival of vehicle which collects the garbage. This method finally helps in keeping the environment clean. Thus, the waste collection is made more efficient.

FUTURE SCOPE:

In future may be use the Autodialed module used in GSM module to get the call in emergency cases. And to easily operated with help of web page. With GPS location and intimate to authority peoples.

REFERANCES

[1] X. Li, H. Wang, Y. Yu, and C. Qian, "An IoT data communication framework for authenticity and integrity," in *Proc. IEEE/ACM 2nd Int. Conf. Internet Things Design Implement. (IoTDI)*, Apr. 2017, pp. 159–170.

[2] *eHealth*. Accessed: Jan. 2019. [Online]. Available: http://www.who.int/topics/ehealth/en/

[3] World Health Organization. *MHealth: New Horizons for Health Through Mobile Technologies*. Accessed: Jan. 2019. [Online]. Available: http://www.who.int/goe/publications/goe_mhealth_web.pdf

[4] M. Gerla, E.-K. Lee, G. Pau, and U. Lee, "Internet of vehicles: From intelligent grid to autonomous cars and vehicular clouds," in *Proc. IEEE World Internet Things (WF-IoT)*, Mar. 2014, pp. 241–246.

[5] G. Wang *et al.*, "Verifiable smart packaging with passive RFID," *IEEE Trans. Mobile Comput.* to be published, doi: 10.1109/TMC.2018.2852637.

[6] *Nest*. Accessed: Jan. 2019. [Online]. Available: https://nest.com

[7] *HVAC Monitoring System*. Accessed: Jan. 2019. [Online]. Available: https://www.sensaphone.com/industries/hvac.php

[8] T. Gupta, R. P. Singh, A. Phanishayee, J. Jung, and R. Mahajan, "Bolt: Data management for connected homes," in *Proc. USENIX NSDI*, Apr. 2014, pp. 243–256.

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 12, S Iss 1, Jan 2023

[9] Y. Kim *et al.*, "Design of a fence surveillance system based on wireless sensor networks," in *Proc. 2nd Int. Conf. Autonomic Comput. Commun. Syst.*, Sep. 2008, pp. 23–25.

[10] A. J. Brush, J. Jung, R. Mahajan, and F. Martinez, "Digital neighborhood watch: Investigating the sharing of camera data amongst neighbors," in *Proc. Conf. Comput. Supported Cooperat. Work*, Feb. 2013, pp. 639–700.

[11] J. Scott *et al.*, "PreHeat: Controlling home heating using occupancy prediction," in *Proc. 13th Int. Conf. Ubiquitous Comput.*, Sep. 2011, pp. 281–291.

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IOT BASED ATTENDANCE TRACKING SYSTEM USING RFID

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ABSTRACT:

RFID is a nascent technology, deeply rooted by its early developments in using radar 1 as a harbinger of adversary planes during World War II. A plethora of industries have leveraged the benefits of RFID technology for enhancements in sectors like military, sports, security, airline, animal farms, healthcare and other areas. In this proposed system, authorized students are given an RFID tag. Thus, the data stored in this card is referred as the identification/attendance of the person. Once the student places the card in front of the RFID card reader, it reads the data and verifies it with the data stored in the microcontroller from the 8051 family. If the data matches, then it displays a message on the LCD confirming the entry of that student else displays a message denying the attendance. The status of a student's attendance can be retrieved from this system by pressing the status button interfaced to the microcontroller. Hence, a lot of time is saved as all the students' attendance is directly stored in the database.

Keywords: GSM, GPS, Switch, Buzzer.

1. INTRODUCTION:

The concept "Internet of Things" (IoT) has recently attracted growing attention from both academia and industry. IoT is a scenario where devices (even animals or people) are provided with unique identifiers and the ability to automatically transmit data over a network without requiring human-to computer interaction [1]. IoT is a scenario where devices (even animals or people) are provided with unique identifiers and the ability to automatically transmit data over a network without requiring human-to computer interaction. RFID forms an essential block of IoT where RFID devices are wireless microchips used for tagging objects for automated identification [2]. Student attendance is an essential part of daily teaching. Traditionally, teachers bear the mission of calling the class names. Consequently, this consumes time, and also does not have any flexibility in generating reports or statistics. To get rid of the manual attendance process, represented by paper sheet signatures, researchers have proposed many technologies that include barcode based attendance systems, face recognition, and fingerprint identification. However, these systems suffer from some hindrances and difficulties [3]. The most common method of tracking student attendance systems is to take a roll call or sign the attendance sheet which is done manually. For a classroom of larger strength, both the methods are

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cumbersome. The roll call method is easily prone to fake attendance in a classroom of large size and it also takes a longer time to call the names of all the students [4]. The significant problems also arise when it comes to the transformation of the paper-based data to an electronic form to be used in student electronic records for calculating the total attendance at various levels (e.g. subject, study program, faculty or university) [5]. In addition to all the aforementioned disadvantages, the most common disadvantage is that all these methods need extra equipment. A proposed system has been developed to address these disadvantages. The main advantages of the proposed system are flexible usage, no equipment costs, no wasted time, and easy accessibility [6]. The classroom attendance system is based on face recognition technology, combined with RFID technology. It realized the identity confirmation of the students in the class effectively. Through the real-time test of the algorithm, it fully meets the requirements of the attendance time in the class, reduces the attendance cost of the classroom, and effectively solves the problem of signing and other issues [7]. For web-server platforms, XAMPP software is used. XAMPP is the software that has complete PHP, Apache, and MySQL web development environments. XAMPP software is a free and open source web-server for local development of web-based applications. SQL is a special purpose programming language designed for managing data held in a relational database management system. The mySQL tool in XAMPP is PHPMy Admin. To store the unique ID in the student card, mySQL is required. In mySQL, four tables have been created, that consists of staff table, student table, student attendance table and student marks [8].

2. LITERATURE SURVEY

The Internet of things (IOT) is the main achievement to reduce the human working and by based on IOT , create solutions for different problems which were not solved in normal technologies . It can interrelated to mechanical and digital machines , ability to transfer data from human to human , human to machine by using the related sensors . The IOT allows objects to be sensed or controlled remotely across existing network infrastructure , creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. IoT is a dynamic global network organization with self configuring capabilities based on standard and interoperable communication protocols In the IoT, physical and virtual things have identities, physical attributes, and virtual personalities and use intelligent interfaces The physical and virtual things‖ are seamlessly integrated into the information network RFID is shaping up to be an important building block for the Internet of Things (IoT). RFID (Radio Frequency Identification) devices are wireless microchips used for tagging objects for automated identification RFID systems consist of a reading device called a reader, and one or many tags the reader is a powerful device with ample memory and computational resources RFID can identify objects wirelessly without line-of-sight. . Attendance system will produces an automatic system which give better routine and efficiency than the traditional method of observing student. Furthermore, RFID technology can help to identify and to monitor items (products, people, student etc) wirelessly within a

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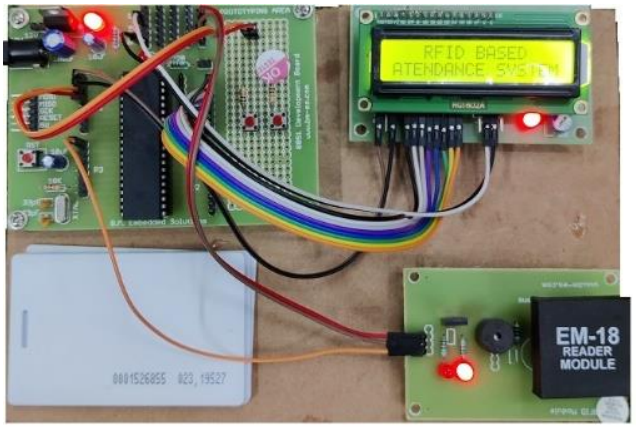
specified distance (a few centimetres to hundreds of meters). In this paper, we describe the proposed RFID system for recognizing and monitoring attendance. In this system, the RFID tags enable the school/college management people to supervise the student movement in and out of the campus. When RFID tags pass through the RFID reader in read range zone, then system will record the data from the RFID tags to the database systems. Have caused students to be less motivated to come to the lecture rooms than ever before. Laziness on the part of students, nonchalance to school work, extra social activities that have no importance in aiding the objectives of the institution and a lot more, may prevent students from attending lectures. Sequel to these, lecturers and administrators in most developing countries have had to come up with ways to ensure a healthy participation from students, and make sure that the student lecturer interactive relationship is kept intact. This in some cases have come in simple forms like roll calls, while in more interesting cases, can be formats like surprise quizzes, extra credit in class, etc. These strategies are however time consuming, stressful and laborious because the valuable lecture time that could otherwise been used for lectures is dedicated to student attendance taking [8] and sometimes not accurate.

3. METHODOLOGY

In our project RFID Based Attendance System using Arduino, RTC & LCD Display. Here Arduino UNO acts as a central processor for controlling all other components as an input/output unit. We have used a 5 volt power supply to power all the components used in this project. RFID Reader module is interfaced with Arduino to read the data from RFID Card/tag. Real Time Clock Module DS3231 is used to display the current time and date on the LCD as well as arriving and leaving time of the users. LCD displays every output like current date & time, information of users, no of staff present or absent and menu options from 1 to 4. Red & Green LED is used for the indication of arriving and leaving. Similarly buzzer produces sound whenever the interrupt is detected. The very important part of this block diagram is the EEPROM part. EEPROM stands for Electrically Erasable Programmable Read Only Memory. It stores the data whenever the users swap the card over the RFID reader.



In this section, we identify some limitations and discuss future plans for our system. For this prototype, due to laboratory limitations, we invited just five volunteers to participate in our experiments and evaluated the system performance on this basis. However, when the number of people is increased, the detection accuracy may be affected. This is because the more people there are; the more likely they are to have similar body features, which will require that we obtain more refined features. In addition, real-time capability may also be a key

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consideration for further enhancing the robustness of our system.

CONCLUSION

Our goal is to develop a secure, portable and ready to deploy RFID-based attendance. The system provides a practical and efficient solution for monitoring student attendance on a large scale. The proposed attendance monitoring system uses the concept of IoT to log and fetch data on the server/cloud and make it available for the user anytime and anywhere. For future work, we would also like to give access to students about their attendance, so they can log in and check their attendance remotely. We would integrate the entire system with a mobile phone application so that all functionality is o the mobile itself. Also, we would like to integrate this system with Canvas or Blackboard using XML interface

Future Scope:

Through this process, we designed this device to reduce the man power and it helps any institute to manage their data of every time. Hence the project is reliable to IOT platform with available components. It is late weight to place it in the any where

REFERANCES

[1] Sri Madhu BM, Kavya K, Devansh. IoT based automatic attendance management system, IEEE International Conference on Current Trends in Computer, Electrical, Electronics and Communication, September 2017. DOI: 10.1109/CTCEEC.2017.8455099

[2] Qianwen M, Fu X, Haiping H, Lijuan S, Ruchan W. Smart Attitude Algorithm with Parrite RFID Tags. IEEE Conference 2018.

[3] Hassan S, Ertan Z, Ghassan AH. New anti-collision protocol for RFID – Based Student Attendance system. 2nd International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT). October 2018. DOI: 10.1109/ISMSIT.2018.8567278

[4] Faisal RB, Khoirun N, Roudhotul AS et al. Implementation of RFID Attendance System With Face Detection Using Validation Viola-Jones and Local Binary Pattern Histogram Method. International Symposium on Electronics and Smart Devices (ISESD). October 2019.

[5] Nguyen HK, Chew MT. RFID – Based Attendance management System, 2nd Workshop on Recent Trends in Telecommunications Research (RTTR) Palmerston North, New Zealand. 2017.

[6] Sri vignesh PSS, Bhaskar M. RFID and Pose Invariant Face Verification Based Automated Classroom Attendance System. International Conference on Microelectronics, Computing and Communications (MicroCom). January 2016.

[7] Wenxian Z, Qinglin M, Ran L. Design of Intelligent Classroom Attendance System Based on Face Recognition. IEEE 3rd Information

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

Technology, Networking, Electronic and Automation Control Conference (ITNEC). March 2019.

[8] Xiao F, Wang Z, Ye N, Wang R, Li XY. One More Tag Enables Fine – Grained RFID Localization and Tracking. IEEE/ACM Transactions on Networking 2019;26:161-78.

IRIS Data Classification using Genetic Algorithm Tuned Random Forest Classification

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Abstract— ***Optimising hyperparameters in Random Forest is a time-consuming undertaking for several academics as well as professionals. To acquire greater performance hyperparameters, specialists should explicitly customise a series of hyperparameter settings. The best outcomes from this manual setting are then modelled and implemented in a random forest algorithm. Several datasets, on the other side, need various prototypes or hyperparameter combinations, which may be time-consuming. To solve this, we offered various machine learning models and classifiers for correctly optimising hyperparameters. Both genetic algorithm-based random forest and randomised CV random forest were assessed on performance measures such as sensitivity, accuracy, specificity, and F1-score. Finally, when compared to randomised CV random forest, our suggested model genetic algorithm-based random forest delivers more incredible accuracy***.

Keywords—Random Forest, Randomized CV

I. INTRODUCTION

Finding a set of ideal hyperparameter settings for a learning algorithm and applying this optimised algorithm to any data set is known as hyperparameter tuning. This set of hyperparameters improves the model's performance by minimising a predetermined loss function and resulting in better outcomes with fewer mistakes. It's worth noting that the learning algorithm optimises the loss based on the input data and attempts to find the best solution possible within the constraints. Hyperparameters, on the other hand, precisely specify this configuration. A Machine Learning framework is a mathematical structure with a series of characteristics that must be learned from data. Researchers might fit the modelling characteristics by utilising available data to build a simulation. Because hyperparameter adjustment in the ML model may significantly impact its predictive performance, it is critical to choose the right hyperparameter for the model [1]. Traditionally, trial and error has done hyperparameter tweaking in ML models. This approach may be highly taxing, depending on how many hyperparameters are in the ML model, mainly when dealing with enormous data.

The hyperparameter tuning issue is often an optimization problem, with the objective function being the model's predicted performance. The following are the common difficulties encountered during hyperparameter adjustment.

- In one dataset, hyperparameter settings may lead to good prediction performance, but not in another.
- Hyperparameters are sometimes interdependent.
- Hyperparameter tuning is a time-consuming operation.

By their opposite side, hyperparameters were parameters that can't be learned using a typical retraining approach. Before the actual training process starts, they are generally rectified. These parameters describe crucial aspects of the model, such as its complexity and learning rate.

1.1 Importance of Hyperparameter

Hyperparameters are crucial since they directly regulate the training algorithm's behavior and significantly affect the model's performance. "A solid selection of hyperparameters can make an algorithm truly shine." Identifying appropriate hyperparameters is critical to the effectiveness of their neural network architecture [2]. Since it substantially impacts the learned paradigm, for instance, if the training frequency is very weak, the system might miss essential data trends. Collisions may happen if it is excessively high.

There are two benefits to selecting the appropriate hyperparameters:

- Effortlessly explore the space of possible hyperparameters.
- It's simple to keep track of many experiments for hyperparameter adjustment.

1.2 Methods for Hyperparameter Tuning

These ideal hyperparameter values may be found using human or automated approaches. When manually adjusting hyperparameters, we usually start with the default suggested values or rules of thumb, then experiment with a range of values. However, manual tweaking is a time-consuming and arduous process[3]. It isn't practicable when there are several hyperparameters with a broad range. Automated hyperparameter tuning approaches look for the best values using an algorithm. Grid search, random search, and Bayesian optimisation are three of the most common computerised approaches.

Grid Search

Grid search is a hyperparameter tuning approach that uses "brute force." We make a grid of potential discrete hyperparameter values and then fit the model with all of them. For each set, we record the model performance and formerly choose the combination that generated the best outcomes. Grid exploration is a thorough approach for finding the optimal hyperparameter combination [4]. The disadvantage is that it is sluggish. Fitting the model with every possible combination generally takes a lot of computing power and time, which may not be accessible.

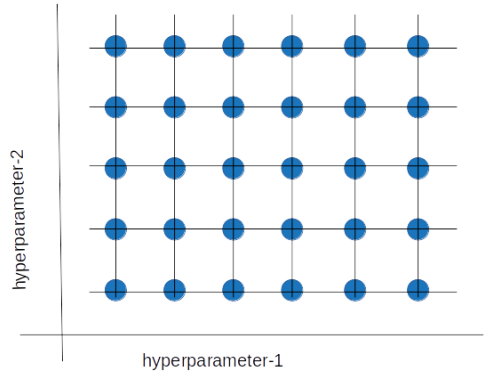

Fig 1.1 Grid Search

Grid search is a time-honoured method of implementing hyperparameters. All combinations are brute-forced. Grid search necessitates the creation of two hyperparameter sets.

1. Number of Layers
2. Learning Rate

Grid searches train the algorithms for all feasible configurations utilising two groups of hyperparameters (training frequency and a number of cells). The effectiveness is tested by employing the "Cross-Validation technique." This process verifies whether our trained model correctly detected the vast percentage of the characteristics in the dataset. The usage of "K-Fold Cross-Validation," which provides lots of information for simultaneous training and validation, has been one of the best ways to validate

Random Search

Unlike the grid search method, the random search technique picks values at random rather than utilising a fixed set of numbers. A random search attempts a different combination of hyperparameters in each iteration and records the model's performance. It returns the combination that gave the most significant outcome after multiple iterations. Random search is acceptable when we have numerous hyperparameters with somewhat big search domains. We can build discrete ranges (for example, [5-100] in 5-step increments) and still have a good collection of options.

The advantage is that random search often takes less time to provide equivalent results than grid search. It also assures us that we don't wind up with a model that favours value sets randomly picked by users. The disadvantage is that the outcome may not be the optimal hyperparameter combination imaginable.

1.3 Hyperparameter Tuning

Standard linear regression does not include hyperparameters since they are not necessary for the model [5]. Regularisation is a hyperparameter used in ridge and lasso regression, two variants of linear regression. The hyperparameters for the decision tree are the maximum depth and the minimum number of observations in each leaf. The optimal values for the model's hyperparameters prevent the model from being over-or under-fit to the data. The optimal values for the hyperparameters might often vary from dataset to dataset. To get the most accurate hyperparameters, the following procedures are carried out:

- The model is examined for each of the suggested configurations of the hyperparameters
- The hyperparameters that provide the best model are chosen to be used in the simulation.

The grid search function of the hyperparameters search selects a grid of hyperparameter values and then evaluates each of those values. Some degree of guesswork is required to set the minimum and maximum values for each hyperparameter. The random search algorithm selects the points on the grid at random for evaluation. A grid search is not as efficient as this method. As specific hyperparameter configurations are chosen, the validation matrices are assessed, the hyperparameters are altered, and the procedure is continued with the validation matrix in adaptive hyperparameter training. Spearmint, an algorithm for hyperparameter optimisation that makes use of Gaussian processes, and Hyper opt are both examples of smart hyper-parameters (hyperparameter optimisation using Tree-based estimators).

1.4 Types of hyperparameter

hyperparameters may be sorted into one of three categories [6]:

Model hyperparameters determine the features of neural network design, like sampling frequency, pooling, padding, and stride, which form the foundation of modelling.

Optimiser hyperparameters are concerned with how the model acquires the patterns based on the data. Optimisers such as gradient descent and SGD (stochastic gradient descent), Adadelta, RMSprop, Adam, and other similar methods are included in this category of hyperparameters. You may find further information on this page about the Keras Optimizer**.**

Data hyperparameters are connected to the characteristics of the data. They are frequently utilised in situations in which there is an insufficient amount of data or an insufficient amount of variance in the data. In cases like these, data augmentation methods like cropping, resizing, and binarisation, amongst others, are used.

Contribution of the study:

The primary goal of this research is to use a genetic algorithm-based random forest classification system to reduce hyperparameter tuning. To demonstrate the effectiveness, the efficiency of this optimisation will be compared to a randomized search CV.

The paper is organised in such a way that the literature review is discussed in section 2, and section 3 is explained about methodology. Section 4 presented about results and discussion, and section 5 concluded the work.

II. LITERATURE REVIEW

Many authors published many articles related to the optimisation of hyperparameters. The authors used different algorithms and classifiers and proposed models to tune the hyperparameters. [7] formulated the tuning issue from a statistical standpoint, defined data-based defaults, and presented generic metrics assessing the tunability of algorithm hyperparameters. Second, we undertake a large-scale benchmarking analysis using 38 datasets from the Open ML platform and six standard machine learning methods. To determine the tunability of their parameters, the author used their measurements. Our findings provide default values for hyperparameters, allowing users to choose if a potentially time-consuming tuning approach cantered on the utmost critical hyper-parameters and appropriate hyper-parameter cosmoses for tweaking is worthwhile. Modern supervised machine learning methods need the setting of hyperparameters before they can be used. Default settings from the software package, straight set up by the handler, or customisation for best prediction performance are all options for establishing hyperparameters.

The author [8] proposed in this paper to use genetic algorithms (GA) to improve ML algorithms systematically and to assess if and how the model should be created to discover global answers for a given data set. The model is evaluated by its accuracy scores as well as the computational time, which is then compared to a search method, specifically exhaustive search, by implementing a GA approach on two ML algorithms Random Forest, on two numerical data sets, Iris data set and Wisconsin breast cancer data set. The findings indicate that GA is effective in obtaining high accuracy scores in a reasonable length of time. There are certain limits since the importance of a parameter to an ML algorithm might fluctuate.

Before and after the hyperparameter tuning procedure, the author noted that [9], the performance of all classifiers is assessed and utilised to generate the dataset. Each hyperparameter tuning strategy is presented in-depth, along with its strengths and drawbacks. According to the findings, SVC provided maximum accuracy before and after the hyperparameter tweaking procedure. Random Search, Bayesian Optimization. Grid Search, PSO (Particle Swarm Optimization), and (GA) Genetic Algorithm are the hyperparameter amendment strategies that are compared in depth. They're used to improve the precision of 6 ML algorithms: LR (Logistic Regression), RC (Ridge Classifier), Decision Tree (DT), Random NB (Naive Bayes), Random Forest (RF), and SVC (Support Vector Machine Classifier). The machine learning replicas are utilised to resolve an Arabic sentiment categorisation issue to examine the effectiveness of each hyperparameter tweaking strategy.

The author [10] elaborated on this topic. One of the most challenging problems to solve when constructing deep learning algorithms is hyperparameter optimisation. To find a solution to this issue, the authors of this research used a genetic algorithm. A fitness assessment was carried out, during which both the accuracy and the verification time were considered. To examine the approach's efficacy, a simple model consisting of only one convolution layer and one fully linked layer was used. The author utilised a model that has three different layers. When training the system, both the MNIST dataset and a motor failure diagnostic dataset were utilised as inputs. The findings indicate that the strategy helps cut down on the amount of time spent training.

The author [11] focused on the notion that this particular form of news is likely to be popular and will earn the proprietor a profit. Because of this, it is essential to use the techniques of prediction to determine if a piece of news will be popular or not. Machine learning is one of the common approaches to prediction that we may take advantage of. To get greater accuracy in predictions, it is necessary to identify the machine learning approach that yields the most outstanding results for the optimal hyperparameter. Because the grid search technique is a method that attempts every conceivable combination of hyperparameters, determining the hyperparameter might be a time-consuming process if the author utilised the grid search method, this is a challenge for us since we need a more accurate forecast of the amount of time people spend reading online news stories. Therefore, a Genetic Algorithm is suggested as the alternate option since a Genetic Algorithm can acquire an ideal hyper-meter within an acceptable time. This is why a genetic algorithm is given as the alternative solution.

The author [12] discussed that the user is responsible for configuring a number of the random forest algorithm's (RF) hyperparameters, containing the number of unexpected observations for every tree as well as if they're not chosen with substitution, the numbers of randomised parameters for every splitting, the splitting algorithm, the minimal amount of sampling which nodes must have, as well as the set of branches. These hyperparameters can be found in the following table. The author should begin by providing a review of literature on the effect of the parameters on the prophecy enactment as well as on capricious significance methods. It is common knowledge that the majority of the time, RF functions adequately through the defaulting settings of the hyper-parameters supplied in software correspondences. This is a well-established fact. Despite this, adjusting the hyperparameters might result in an improvement in the performance of RF.

III. METHODOLOGY

This study aims to tune the hyperparameter with the help of a genetic algorithm. For hyperparameter tuning, find a set of ideal hyperparameter settings for our proposed algorithm. Then follows hyperparameter optimisation. It would be to identify the hyperparameter variable in machine learning autonomously. A genetic algorithm-based random forest was suggested in this paper. The genetic algorithm will be employed during the categorisation procedure to improve the machine learning classified results. We compare these accuracy results of genetic algorithm-based random forest with randomised CV-based Random Forest. In every cycle, the Genetic Algorithm employs crossing and mutations to generate a new resolution. The Genetic Algorithm will improve its answer with each repetition.

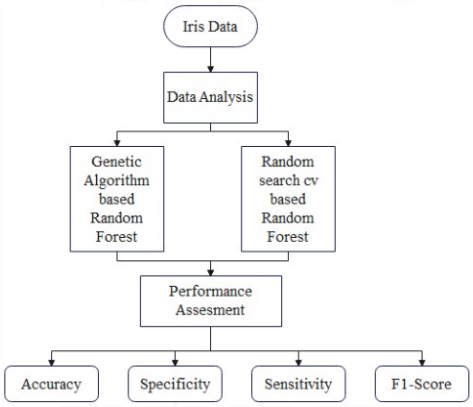

Fig. 3.1 Methodology Flow

3.1 Data Description

For implementing optimized hyperparameter tuning, the iris flower data set is chosen from the following link https://www.kaggle.com/datasets/uciml/iris.

It comprises 3three iris species, each of which has 50 samples and certain floral characteristics. One flower species can be distinguished among the remaining two linearly, while the additional two cannot. Because there are no incomplete values in this dataset and most of the data exists in integers, there is no need for a pre-processing procedure to patch in the gaps and convert the data. The columns in this dataset are: Id, SepalLengthCm, SepalWidthCm, PetalLengthCm, PetalWidthCm, Species.

Table 3.1 List of Features

Features	Feature description	Sample Data
SepalLengthCm	Length of iris flower sepal in centimeters	5.1, 4.9, 4.7, 4.6
SepalWidthCm	Width of iris flower sepal in centimeters	3.5, 3.0, 3.2, 3.1
PetalLengthCm	Length of an iris flower petal in centimeters	1.5, 1.0, 1.2, 1.1
PetalWidthCm	Width of an iris flower petal in centimetres	0.4, 0.2, 0.5, 0.2
Species	Species of iris flower	Setosa, Virginica, Versicolor

3.2 Data Analysis
The data analysis section discussed machine learning models and optimisation techniques such as genetic algorithm, randomised CV, random forest classifier, and hyperparameter optimisation.

3.2.1 Genetic Algorithm
The genetic algorithm is a strategy predicated on natural selection, the process that drives biological change, for solving confined and unconstrained optimisation challenges. A group of particular solutions is adjusted periodically using the genetic algorithm. At every step, the genetic algorithm selects individuals from the current population to serve as parents and uses their kids to produce the next generation's offspring. The populace "develops" approaching an optimal solution over successive years. You could use the genetic algorithm to solve various optimisation problems that aren't ideally suitable for traditional optimization approaches, such as problems with no differentiable, stochastic, discontinuous, or severely nonlinear objective functions. The evolutionary algorithm may handle issues of mixed-integer programming, where certain components are constrained to be integer-valued.

3.2.2 Randomized search CV
It offers the Randomized Searching CV for randomised searching and the GridSearch CV for grid searching. Both strategies use cross-validation to test predictions for a specific hyperparameter vector, thus the "CV" suffix on every category label. Two inputs are required for each class. The initial is the model you're trying to improve.

The only difference between the two methods is that in grid search, we specify the combinations and then train the model. In randomised search CV, the model chooses the combinations at random. This is the sole distinction between the two methods. Both of these methods of tweaking the parameters to enhance the model's generalizability are quite successful.

3.2.3 Random Forest Classifier
A technique for automatic learning known as Random Forest uses several decision trees. It is also possible to utilise it as a classifier or regressor. When the random forest is first to run, a random number of the tree's nodes is chosen using the randomization method. The number of trees in a Random Forest is the Random Forest's hyperparameter. Other examples include the depth of the tree. If it is tweaked, it has the potential to yield more significant outcomes than when utilising a hyperparameter in its default setting.
It is one of the most effective methods of categorisation that may be used in the modern world. It is a supervised technique in which the forest is an ensemble of decision trees, which are formed using the "bagging" approach, which selects random bootstrap samples from the training set of the data. The trees themselves are created using the "bagging" method. In addition, training the individual trees pulls random selections of characteristics, which ultimately results in the trees becoming more autonomous. Having a more significant number of separate trees may sometimes provide more accurate results in predictive modelling. Because each tree only learns from a subset of the available characteristics, this technique is even more efficient than bagging.

3.2.4 Hyperparameter Optimization method
A classification made using machine learning techniques requires the use of a parameter known as the hyperparameter. Each approach to machine learning has its own unique set of hyperparameters.
The accuracy of a forecast may be significantly improved by carefully selecting the appropriate parameters. Because of this, it is essential to modify the hyperparameter rather than relying on the default settings for machine learning. The

values for these hyperparameters may be determined manually by testing every combination. But doing it out takes a considerable amount of time since so many different permutations may occur. Because of this, an optimisation technique that can automatically determine the best hyperparameter, like Grid Search, is used rather often.

3.3 Performance Metrics

To assess an algorithm's performance in terms of the confusion matrix's performance measures, such as precision, F1-score, accuracy, and sensitivity are used.

Accuracy: The proportion of subjects successfully identified to the entire number of subjects.

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN}$$

Sensitivity: The fraction of accurately positive labels identified by our computer is *called* recall, often referred to as sensitivity.

$$Sensitivity = \frac{TP}{TP + FN}$$

Precision: It is possible to calculate an outlook's precision by considering the total number of accurate forecasts. Predictive value is another title for this concept.

$$\Pr ecision = \frac{TP}{TP + FP}$$

F1-Score: The F1-score is a statistic that considers both accuracy and recall.

$$F1 - score = 2 * \frac{\Pr ecisison * \mathrm{Re} call}{\Pr ecision + \mathrm{Re} call}$$

Where,
TP= True Positive, TN= True Negative, FP= False Positive, FN= False Negative.

IV RESULTS

This section determines the performance metrics to tune the hyperparameters of a genetic algorithm-based Random Forest and a Randomized CV-based Random Forest.

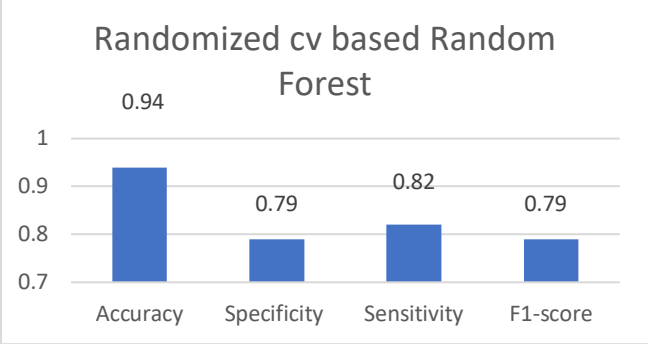

Fig 4.1 Randomized CV based Random Forest

From the above graph, we evaluated the performance metrics (accuracy, specificity, sensitivity, F1-score) of the Randomized CV-based Random Forest. The accuracy of Randomized CV-based Random Forest is 0.94.

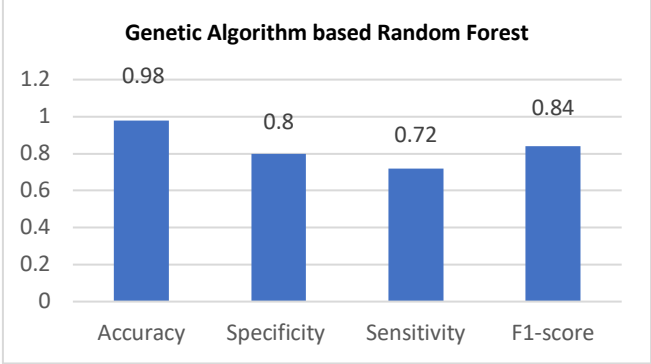

Fig. 4.2 Random Forest

From the above graph, we evaluated the performance metrics (accuracy, specificity, sensitivity, F1-score) of the Genetic algorithm-based Random Forest. The accuracy of a Genetic algorithm-based Random Forest is 0.98.

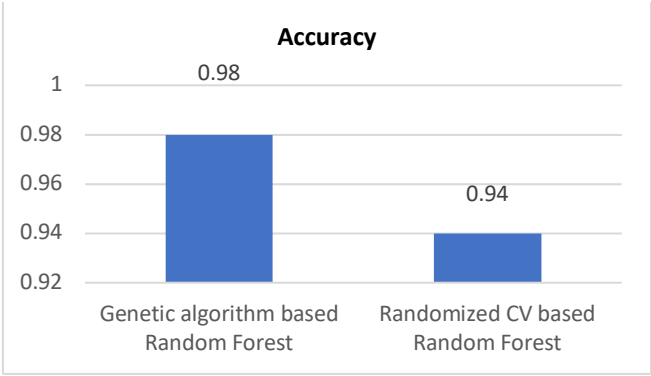

Fig. 4.3 Accuracy

From the above graph accuracy of a genetic algorithm-based Random Forest is 0.98, and the accuracy of a Randomized CV-based Random Forest is 0.94. genetic algorithm-based Random Forest provides better accuracy compared to Randomized CV-based Random Forest.

V CONCLUSION

The primary objective of this research is to assess the performance of our suggested model in addition to tuning the hyperparameters by utilizing a machine learning model as the primary tool. To accomplish this goal, we began by determining the hyperparameter search strategy that centres on random forests. In this case, our suggested model is an evolutionary algorithm based on a random forest. We assessed our proposed model to determine its performance so that we could modify the hyperparameters. To determine which model produces superior results when optimising the

hyperparameters, we contrasted the model that we suggested with one based on a randomized CV random forest. Both randomised CV random forest and genetic algorithm-based random forest were evaluated based on performance parameters such as accuracy, sensitivity, and specificity, as well as F1-score. Finally, our proposed model, a genetic algorithm-based random forest, is more accurate at 98% than the randomised CV random forest, which is at 94%. Hence genetic algorithm-based arbitrary forest classification is highly capable of optimising the hyperparameter tuning.

REFERENCES

[1] W. Xiang and Y. Zhining, "Neural network hyperparameter tuning based on improved genetic algorithm," *ACM Int. Conf. Proceeding Ser.*, pp. 17–24, 2019, doi: 10.1145/3373509.3373554.

[2] S. Gobeyn, A. M. Mouton, A. F. Cord, A. Kaim, M. Volk, and P. L. M. Goethals, "Evolutionary algorithms for species distribution modelling: A review in the context of machine learning," *Ecol. Modell.*, vol. 392, pp. 179–195, 2019, doi: 10.1016/j.ecolmodel.2018.11.013.

[3] P. Kumar, S. Batra, and B. Raman, "Deep neural network hyper-parameter tuning through twofold genetic approach," *Soft Comput.*, vol. 25, no. 13, pp. 8747–8771, 2021, doi: 10.1007/s00500-021-05770-w.

[4] C. Guo, L. Li, Y. Hu, and J. Yan, "A Deep Learning Based Fault Diagnosis Method with Hyperparameter Optimization by Using Parallel Computing," *IEEE Access*, vol. 8, pp. 131248–131256, 2020, doi: 10.1109/ACCESS.2020.3009644.

[5] H. B. S. S and S. Kumar, "LEAPMood: Light and Efficient Architecture to Predict Mood with Genetic Algorithm driven Hyperparameter Tuning," no. January, pp. 1–8, 2022, doi: 10.1109/icsc52841.2022.00009.

[6] S. Sanders and C. Giraud-Carrier, "Informing the use of hyperparameter optimization through metalearning," *Proc. - IEEE Int. Conf. Data Mining, ICDM*, vol. 2017-November, pp. 1051–1056, 2017, doi: 10.1109/ICDM.2017.137.

[7] P. Probst, A. L. Boulesteix, and B. Bischl, "Tunability: Importance of hyperparameters of machine learning algorithms," *J. Mach. Learn. Res.*, vol. 20, pp. 1–32, 2019.

[8] F. David Krüger and M. Nabeel, "Hyperparameter Tuning Using Genetic Algorithms A study of genetic algorithms impact and performance for optimization of ML algorithms," 2021.

[9] E. Elgeldawi, A. Sayed, A. R. Galal, and A. M. Zaki, "Hyperparameter tuning for machine learning algorithms used for arabic sentiment analysis," *Informatics*, vol. 8, no. 4, pp. 1–21, 2021, doi: 10.3390/informatics8040079.

[10] J. H. Han, D. J. Choi, S. U. Park, and S. K. Hong, "Hyperparameter Optimization Using a Genetic Algorithm Considering Verification Time in a Convolutional Neural Network," *J. Electr. Eng. Technol.*, vol. 15, no. 2, pp. 721–726, 2020, doi: 10.1007/s42835-020-00343-7.

[11] A. S. Wicaksono and A. A. Supianto, "Hyper parameter optimization using genetic algorithm on machine learning methods for online news popularity prediction," *Int. J. Adv. Comput. Sci. Appl.*, vol. 9, no. 12, pp. 263–267, 2018, doi: 10.14569/IJACSA.2018.091238.

[12] P. Probst, M. N. Wright, and A. L. Boulesteix, "Hyperparameters and tuning strategies for random forest," *Wiley Interdiscip. Rev. Data Min. Knowl. Discov.*, vol. 9, no. 3, pp. 1–19, 2019, doi: 10.1002/widm.1301.

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IOT BASED THEFT CONTROL AND AUTO ALERTING WITH GSM

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ABSTRACT:

IoT has been a great area of research for providing excellence in area of designing smart cities and intelligent systems. Fuel theft from standing vehicles is a major problem which can be very easily resolved using this technique. In this paper we have proposed a system for detection of fuel theft from vehicle using the concept of IoT as well as wireless sensor networks. The method has shown very good results as compared to other state of the art methods. Security is a too much important thing to be concerned in our day-to-day life. Everyone wants to be secured as much as possible. Knowing our home or shop is secure provides us peace of mind. We know now a day's theft has become a major issue. In this project we design an advanced electronic security system by using small PIR and IR sensors built around the Node MCU controller. PIR sensor sense the presence of intruder & Controller reads the signal from sensors and if intruder is detected, it compares the detected image with predefined images in the database then it turns on the buzzer as well as making a notification to predefined number. At the same time the video of intruder can also be monitored and make them anesthetic.

Keywords: PIR, GSM, BUZZER.

1. INTRODUCTION:

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We have designed an interesting and cost effective security alarm for highly authentication places. This Gadget helps you to protect your areas from thieves. In this project we are going to use a Node MCU, P.I.R Sensor module, LCD, DVR device and some other components. This Project can either powered with 9V Battery or with U.S.B of your computer. This is a basic motion-sensing alarm that detects when someone enters the area. When an intruder is detected, it compares the detected image with predefined images in the database then it activates a siren. Our body generates heat energy in the form of infrared which is invisible to human eyes. But it can be detected by electronic sensor. This type of sensor is made up of crystalline material that is Pyroelectric. In this project, we are using P.I.R. Motion Sensor Module as an infrared sensor that generates electric charge when exposed in heat and sends a signal to Node MCU. According to level of the infrared in front of sensor, Node MCU displays the status on L.C.D and starts buzzing speaker and glows the L.E.D. A simple program is running on Arduino IDE which checks sensor if anything is moved or new object has been detected.

2. PREVIOUS STUDY:

Internet of Things (IoT) attracts much attention recently and paints a beautiful picture of future life for us. It is a technology that deals with bringing control of physical devices over the internet. In the upcoming years, IoT-based technology will offer advanced levels of services and practically change the way people lead their daily lives. Advancements in medicine, power, gene therapies, agriculture, smart cities, and smart homes are just a very few of the categorical examples where IoT is strongly established. Here we propose an efficient anti-theft system that allows users to efficiently

monitor the condition of the vehicle over the internet. This technology is the wireless sensor network technology, which mainly uses interconnected intelligent sensors to sense and monitoring. Our system uses a microcontroller Node MCU for processing all user commands. We have used Node MCU because it has an inbuilt Wi-Fi module that is used to connect to the internet and receive user commands. The device will monitor the environment using the different sensors and with the help of the internet, information is sent to the server using Wi-Fi. The Server will accept the information from only one particular IP (internet protocol) address and then represent the data in the form of the JSON (JavaScript Object Notation). JSON (JavaScript Object Notation) data will further used to represent the monitored data in the form of the Google graph. Each sensor is having its unique graph which represents the latest entries that are sent by the device.

3. PROPOSED SYSTEM:

With the growth in wireless technology, the danger of attacks is also increase. For making wireless technology secure cryptographic methods can be used. But cryptographic methods can defense outside attacks. Intrusion detection system monitors traffic of the sensor nodes and detect abnormal behavior of the nodes. The major approaches that an Intrusion Detection System can used to specify attacks are [8]: 1. Anomaly Detection: this approach checks whether the behavior of the nodes can be consider normal or not. The approach first describes the feature of the normal node. After that any activity that is not describe into the feature behavior of node is consider as anomalous. Advantage of this method is that it can detect novel attacks. And the disadvantage of this method is false

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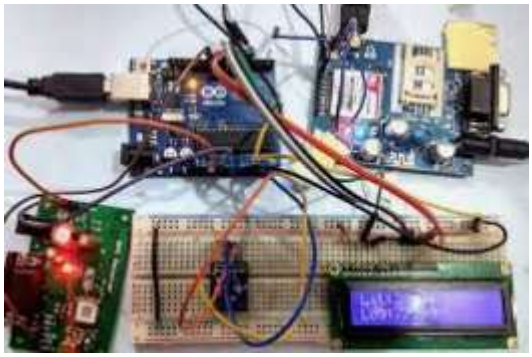
alarm rate is high. 2. Misuse Detection: this is rule-based method, rules are define on the basis of the signature of known attacks. The behavior of nodes is compare with known attacks. and if behavior match with predefined rules then attack detected. This method works efficiently if the attack is known, but fails if the attack is novel attack. 3. Specification-based Detection: this method is combination of anomaly detection and misuse detection. This method focus on discovering deviation from normal behaviors. In this mechanism the behavior that can be consider normal is defined manually by human. Drawback of this approach is manually defining the all specification. The methodology used in the proposed model is to develop a prototype model of a house, in the prototype an interface of mercury switches, motion detectors, and WiFi module is being developed with a microcontroller. The communication between the microcontroller and other.



4. CONCLUSION:

In this paper a method for detecting the fuel theft of vehicle has been proposed. The method has been developed using recent IoT and wireless technologies provided by new java bases libraries. It is observed that the method has shown very good results as compare to other state of the art methods. The security system described in this project is capable of detecting intruders. The system informs the authorized owner of an unauthorized intrusion via SMS no matter where the person is, except if the person is in the region where there is no network coverage at the time of intrusion. The commonly

available systems today are one where the intrusion is detected via alarms making out sounds. The system is very beneficial for people who wants to safe guard their properties and restrict access. This system is very affordable and easily operated, so that anybody whether rich or comfortable, young or old can make use of this system.

REFERENCES:

[1] Audette, W. E., Kynor, D. B., Wilbur, J. C., Gagne, J. R., & Peck, L."Improved Intruder Detection Using Seismic Sensorsand Adaptive Noise Cancellation" 2009.

[2] AyushAgarwal, R.C.Joshi, " WSN and GSM based Home Security Sytems", IJCA Proceedings on International Conference on Recent Advances and Future Trends in Information Technolgy (iRAFIT 2012), Number 2.

[3] I.Syam Krishna, J. Ravindra, " Design and Implementation of Home Security Sytem based on WSNS and GSM Technology" International Journal of Engineering Science and Technology" Volume 2,Special Issue 1,Page 139-142.

[4] V. Karri and J. S. Daniel Lim, "Method and Device to Communicate via SMS After a Security Intrusion", 1st International Conference on Sensing Technology, Palmerston North, New Zealand, (2005) November 21-23.

[5] Z. Bing, G. Yunhung, L. Bo, Z. Guangweiand T. Tian, "HomeVideo Security Surveillance", Info-Tech and Infonet, 2001,Proceedings,ICII 2001-Beijing. 2001 International Conference, vol. 3, pp. 202-208.

[6] Mahmud S.A, Mohameed G.A, "development of a simple sound activated burglar alarm system" Leonardo journal of sciences. Issue 9, July-Dec 2006.

[7] Prakash Kumar, Pradeep Kumar, "Arduino Based wireless intrusion detection using IR sensor and GSM", International Journal of Computer Science and Mobile Computing, Vol 2,Issue 5, May, 2013.

[8] R. Sharma, K. Kumar, and S. Viq, "DTMF Based Remote Control System," IEEE - International Conference ICIT 2006, pp.2380-2383, December 2006.

[9] Chun-Liang HSU, Sheng-Yuan Yang and Wei-BinWu,2009, "Constructing Intelligent Home-Security System Design With Combining Phone-Net And Bluetooth Mechanism", Proceedings of the Eighth International Conference on Machine Learning and Cybernetics, St. John's University, Taiwan.

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IOT BASED ALCOHOL & HEALTH MONITORING SYSTEM

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ABSTRACT:

Healthcare is given the extreme importance now a- days by each country with the advent of the novel corona virus. So in this aspect, an IoT based health monitoring system is the best solution for such an epidemic. Internet of Things (IoT) is the new revolution of internet which is the growing research area especially in the health care. With the increase in use of wearable sensors and the smart phones, these remote health care monitoring has evolved in such a pace. IoT monitoring of health helps in preventing the spread of disease as well as to get a proper diagnosis of the state of health, even if the doctor is at far distance. In this paper, a portable physiological checking framework is displayed, which can constantly screen the patient's heartbeat, temperature and other basic parameters of the room. We proposed a nonstop checking and control instrument to screen the patient condition and store the patient information's in server utilizing Wi-Fi Module based remote correspondence. A remote health monitoring system using IoT is proposed where the authorized personal can access these data stored using any IoT platform and based on these values received, the diseases are diagnosed by the doctors from a distance.

Keywords: Heart beat sensor, Temperature sensor, IOT.

1. INTRODUCTION:

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Health is always a major concern in every growth the human race is advancing in terms of technology. Like the recent corona virus attack that has ruined the economy of China to an extent is an example how health care has become of major importance. In such areas where the epidemic is spread, it is always a better idea to monitor these patients using remote health monitoring technology. So Internet of Things (IoT) based health monitoring system is the current solution for it [1]. Remote Patient Monitoring arrangement empowers observation of patients outside of customary clinical settings (e.g. at home), which expands access to human services offices at bring down expenses [2]. The core objective of this project is the design and implementation of a smart patient health tracking system that uses Sensors to track patient health and uses internet to inform their loved ones in case of any issues. The objective of developing monitoring systems is to reduce health care costs by reducing physician office visits, hospitalizations, and diagnostic testing procedure [3]. Each of our bodies utilizes temperature and also pulse acknowledging to peruse understanding wellbeing. The sensors are linked to a microcontroller to track the status which is thus interfaced to a LCD screen and additionally remote association with have the capacity to exchange alarms. If framework finds any sudden changes in understanding heart beat or body temperature, the framework consequently alarms the client about the patients status over IOT and furthermore indicates subtle elements of pulse and temperature of patient live in the web. In this manner IOT set up tolerant wellbeing following framework viably utilizes web to screen quiet wellbeing measurements and spare persists time.

There is a significant capability between SMS based patient flourishing viewing and IOT based patient checking framework. In IOT based framework, subtle parts of the patient flourishing can be seen by different clients [4]. The explanation behind this is the information should be checked by passing by a site or URL. While, in GSM based patient viewing, the flourishing parameters are sent utilizing GSM by strategies for SMS. In most of the rural areas, the medical facility would not be in a hand reach distance for the natives [5]. So normally the people neglect any kind of minor health issues which is shown in early stages by variation of vital elements like body temperature, heartbeat rate etc. Once the health issue has been increased to a critical stage and the life of the person is endangered, then they take medical assistance, which can cause an unnecessary waste of their earnings. This also comes into account especially when certain epidemic is spread in an area where the reach of doctors is impossible. So to avoid the spread of disease, if a smart sensor is given to patients, who can be monitored from a distance would be a practical solution to save many lives.

2. PREVIOUS STUDY:

The carelessness and unconsciousness of the drunken drivers creates a huge problems to the people on road. In the modern era, Road Safety is considered to be one of the mostly concerned social issues. The habit of drunken driving causes damage to the surroundings and every person around him. The consumption of alcohol results in unconsciousness and fatigue while driving. The Government has taken many preventive measures to avoid drunken drive accidents. In order to minimise the DUI (Driving Under Influence of alcohol) related accidents, Supreme Court has ordered to shut

down all the selling points on National and State Highways on Dec 15, 2016. But it's effective implementation is not possible due to many social political issues. However we can minimise the accidents by installing the proposed system inside the vehicle. This system continuously monitors the air exhaled by the driver with the help of MQ-3 sensor (alcohol sensor) and update these values in cloud through IoT. If any alcohol detection is found above the threshold value then the system stops the vehicle ignition system. This action is achieved by stopping the fuel supply to the ignition system. And also, the deaths due to cardiac arrest while driving is more. So, this system is constructed to monitor the heart beat rate of the driver. Heart beat rate monitoring sensor is used to monitor the driver's heart beat rate and these readings are stored in the cloud through IoT. If any abnormal heart beat rate is detected, then the system will send the driver's current status to their friends using IoT. The proposed system is highly efficient in monitoring the alcohol consumption level and heart beat rate of the driver. Since the sensor readings are stored in the cloud, it can be used in future.

3. PROPOSED SYSTEM:

In this system, mq3(alcohol) sensor is placed at helmet of the driver to detect the alcohol consumption level of driver and heart beat sensor is placed at the handle-bar of the motorbike to monitor the heart beat rate. The results obtained by the sensors are analog values and it is processed by the controller with the help of wifi through internet. The results obtained from sensors are constantly updated to cloud using IoT. When the resultant values obtained from alcohol sensors attains the threshold limit, then the system prevents the chances of accident by stopping the vehicle ignition system and stores the alcohol consumption

values to the database of the vehicle user. The heart beat rate of the driver is also continuously monitored with the help of appropriate heart beat rate detection sensor and the data are updated in the database. In case of any abnormal detections in heart beat rate of the driver, then the current status of the person are informed to their relatives through IoT.

MQ-3 sensor detects the presence of alcohol consumed by the driver. It can sense the alcohol content ranging from 0.04 mg/L to 4 mg/L. It can operates at temperatures between -10'C to 50'C. It requires a minimum power supply of less than 150Ma to 5V.It consists of total 6 pins, but we use only 4 pins. The two pins A, H are used for heating purposes and the other two pins are used for ground and power. The heart beat rate of the driver is detected using a heart beat monitoring sensor. The sensor board consists of IR (Infra-red) transmitter and IR (Infra-red) receiver, which are placed in straight line to each other. It also has 3 pins (ground, power supply, output).In-order to measure the pulse rate, the finger is placed in-between the IR sensors. This sensor module is attached to the handle-bar of the motorbike. The variation in the IR sensor readings provides the appropriate heart beat rate of the driver. When an abnormal heart beat rate is detected, then the current health status of the driver comprising of his/her heart beat rate is send to their relatives through IoT.

The network of physical devices, home appliances embedded with electronics, sensors, software, actuator and network with proper internet, connect

together to store, share, process data is called as Internet of Things (IoT). The applications for internet connected devices are extensive. IoT helps object to sense data and control it remotely.The system consisting of network connected embedded devices with minimum CPU, power resources and memory is responsible of collecting appropriate information from natural ecosystem to perform the proposed function.

4. CONCLUSION:

In today's world, the accidents due to drunken drive and rash driving cause a great damage to the lives of common people. Even though, the government passes many bills and laws to minimise and control the accidents done under the influence of alcohol. But it is not effective. However, the proposed system could minimise and control the accidents made due to drunken and drive. This system continuously monitors the alcohol level consumed by the driver and when, it attains the maximum threshold value then the system stops the ignition system of the vehicle preventing the accidents. Moreover, it also monitors the heart beat rate of the driver frequently. The sensor readings are updated in the cloud from time to time through IoT. Even if the driver tries to escape after commiting the accident, the readings in the cloud will act as a major evidence for the police to punish the culprit.

REFERENCES:

1. Keerthana K, Ramya G DRUNK DRIVING DETECTION USING CARIGNITION LOCKING 2018 International Journal of Pure and AppliedMathematics.

2. Tejaswini Patil, Aliya Tabassum AUTOMATIC ENGINE LOCKING SYSTEM ALCOHOL DETECTION FOR DRUNK & DRIVE WITH GSMNational Conference on Advances in Engineering and Applied Science.

3. Muthulakshmi.M, Santhiya.K, Prof.Dhivya.P-SMART HELMET SYSTEM USING ALCOHOL DETECTION FOR VEHICLE PROTECTION, IJIRTSE,ISSN: 2395-5619, Volume – 2.

4. Prof. Kulkarni P.H, Ms. Ravina Wafgaonkar, Mr. Gaurav Ahirrao ALCOHOL DETECTION AND AUTOMATIC DRUNK AND DRIVE AVOIDING

SYSTEM International Journal of Engineering Research and ApplicationsApril 2014.

5. M.H. Mohamad, Mohd,AminBin Hasanuddin,"Vehicle Accident Prevention System Embedded with Alcohol Detector",IJRECE,Volume 1-Issue 4.

6. "Alcohol Detection and Accident Prevention of Vehicle", IJIERE, Volume-2, Issue-3, 2015.

7. K.R. Darshan and K.R. Anandakumar, "A comprehensive review on usage of internet of things (IoT) in healthcare system," in Proc. International Conference on Emerging Research in Electronics, Computer Science and Technology, 2015.

8. Internet of Things (IoT): Number of Connected Devices Worldwide From 2012 to 2020 (in billions). [Online]. Available: https://www.statista.com/statistics/471264/iotnumber of-connected- devices-worldwide/

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IOT BASED AUTOMATIC TOLL GATE COLLECTION SYSTEM

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ABSTRACT:

In this venture we address the troubles faced at toll plaza & additionally introduce identity system for vehicles against which stolen and twist of fate cases are registered using RFID. The owner has to create an account through mobile application & sign up his RFID tag. When vehicle passes thru Toll Collection Unit (TCU) it is classified as passenger or goods carrying vehicle primarily based on its Unique Identification Number. A goods vehicle is weighed at TCU & if it's far overloaded then charged with greater tax. UIN is surpassed to Central Server Unit wherein the balance receives deducted from account. Once the balance is deducted at CSU it'll indicate TCS to open the barricade and automobile is permitted to skip. If automobile is detected to be stolen at CSU it will indicate TSC no longer to open the barricade. Also to triumph over the hassle of hit & run instances collision detection mechanism is carried out using piezoelectric sensor in vehicle to identify RFID of collided motors. This info can be used for similarly motion.

Keywords: RFID, RFID TAG, Internet of things, IOT Platform, Cloud connecting.

1. INTRODUCTION

In our daily life we often visit toll plaza. At toll plaza we face the problems like congestion, wastage of time and fuel. To overcome the above problems it is necessary to speed up the process at toll plaza. Hence to overcome the problems faced at toll plaza we use RFID based toll collection system.

The processing time require for RFID Toll Collection System is much less than manual toll collection system. Manual toll collection system also leads to human errors which may lead to incorrect toll collection. We also often get to hear that the number of hit and run cases is increasing day by day. It may even leads to loss of life. It is difficult to apprehend the culprit in hit and run case. It is observed that when the vehicle is stolen it is very difficult to track the vehicle. It is very necessary to control these above problems. So, the system also has an additional feature of detecting the vehicles against which stolen and accident cases are registered. It is observed that overloading the vehicles may lead to accident and also damage the roads. This problem is also address in system by weighing goods carrying vehicle and charge them with extra toll if it is overloaded so that they will not overload again. System also makes payment system easy by making all transaction online using mobile application. In this paper we accomplish work of vehicle identification during collision by exchanging RFID numbers, which will help to find the culprit in hit and run cases. This paper is organized as follows. Section II consists of literature survey. In this field III, components to be used are specified. Section IV describes system model and detailed working of system. In Section V, we have shown experimental result to evaluate our proposed system. Section VI provides conclusion. Section VII gives information of future work.

2. RELATED STUDY

A research in field of application of RFID system is increasing on huge scale. The main reason for such a huge appeal for RFID is low cost and low maintenance of RFID system. Some of the existing applications of RFID system are logistic and supply chain visibility, item level inventory tracking, manufacturing, access

control, animal tagging, library system, real time location system, etc. The RFID system is also used in toll collection system following systems gives detailed scenario. In [5] the system comprises of toll collection unit, when vehicle arrives at toll plaza a RFID number of tag is detected and toll amount is deducted from corresponding user account then the vehicle is allowed to pass. In [4] the system comprises of toll collection unit, when vehicle arrives at toll plaza the RFID number of tag is extracted and balance is deducted from corresponding user account. Once the balance is deducted the information of transaction and balance left in account is sent on user mobile using GSM module, so that user has a valid proof of transaction. In [1] system comprises of toll collection unit and stolen vehicle detection mechanism. In this system when vehicle arrives at toll plaza it checked whether vehicle is stolen or not. If it is found to be stolen information is forwarded to owner. Otherwise balance is deducted from user account and vehicle is allowed to pass. In [3] the automation of toll plaza has been done based on image processing. ANPR (Automatic Number Plate Recognition) system has been employed for detection of vehicle. When vehicle arrives at toll plaza a camera is used to capture the image of number plate of vehicle. Once the image is captured ANPR system is use to extract the number of vehicle. When the number is extracted a toll amount is deducted from corresponding user account. In this system RFID is not required, but system requires high installation cost. A number of automobile companies are working to develop efficient vehicle identification during collision mechanism to detect the culprit in hit and run cases. Implementation of existing vehicle collision detection system is expensive. Hence it is provided only for luxury vehicles. In [7] the system use GPS and Zigbee

module for vehicle identification during collision. When collision occurs vibration sensor placed in front of these vehicles senses the vibration and gives alert to traffic police via Zigbee. In this case if culprit tries to escape without stopping, then vibration sensor in vehicle send corresponding location to traffic cops server via Zigbee.

3. AN OVERVIEW OF PROPOSED SYSTEM

This project gives the simplified procedure to passengers to pay toll at toll booths by making them automated, vehicle theft detection, signal breaking avoidance, tracking over speed vehicles. All these activities are carried using single RFID tag thus saving the efforts of carrying money and records manually.

A. Automatic Toll Collection: The RFID Readers mounted at toll booth will read the prepaid RFID tags [4] fixed on vehicles' windshield and automatically respective amount will be deducted. If the tag is removed from the windshield then cameras fixed at two sites at toll plaza take snaps of the front and back number plate. Since every vehicle registration ID is linked to users account, toll can be deducted from the account bank directly.

B. Vehicle Theft Detection: When vehicle is stolen the owner registers complaint on the website with its registration ID and unique RFID tag number. Now when stolen vehicle passes by the toll plaza, the tag fixed on it is matched with the stolen vehicle's tag in the database at the toll booth.

Fig.3.1. Hardware kit.

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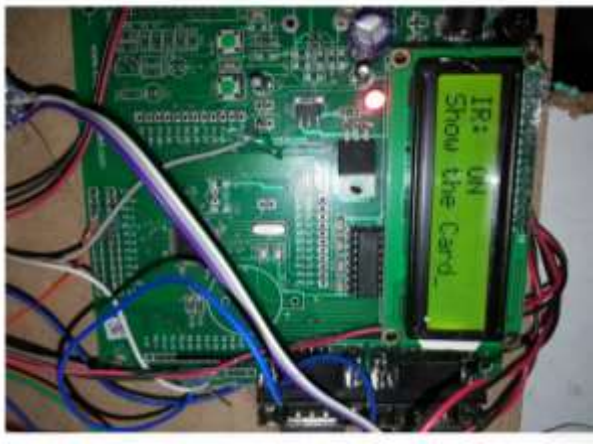

Fig.3.2. Waiting fot RFID card.

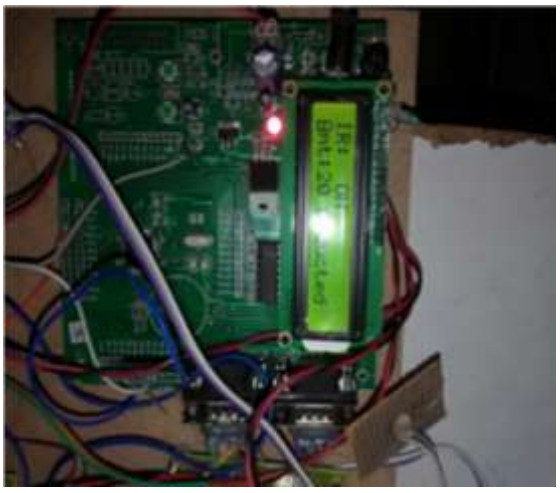

Fig.3.3. Amount automatically dedect in account.

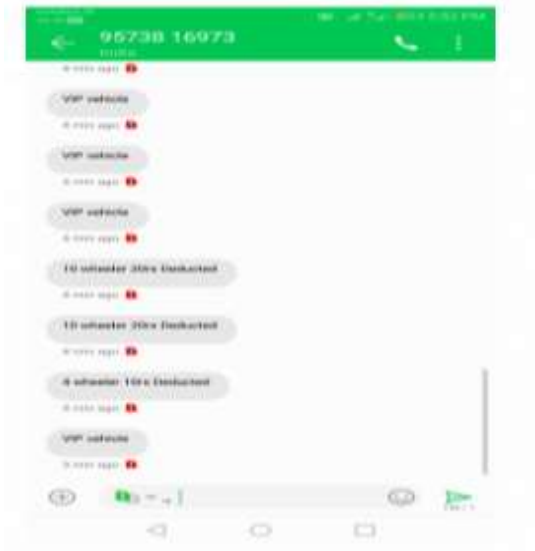

Fig.3.4. Output Results.

4. CONCLUSION

In order to reduce the congestion and time wastage at toll plaza, the toll collection system is to be implemented. The theft detection system is to be implemented for detection and tracking of stolen vehicles when it arrives at toll plaza. In order to make payment mode easy and also to keep record of account on user side mobile application needs to be develop.

REFERENCES

[1] Mahesh Sutar, Mahesh Patil , Sachin Waghmare "Smart Attendance System Using RFID In IOT",April 2016 http://ijarcet.org/wp-content/uploads/IJARCETVOL-5-ISSUE-4-1155-1159.pdf.

[2] Amin A. Al-Zarouni, Nassar H. Fakhro —Mobile RFID Tracking System‖ Computer Engineering Department American University of Sharjah, UAE 2015

[3] Member), Z. Chalhoub, and S. EI Dahdaah, —An RFID Attendance and Monitoring System for University 2014 Applications ‖Department of Electrical and computer and communication Engineering Notre Dame University Louaize Zouk Mosbeh, 2014 978-1-4244-8157- 6/102010.

[4] Dawes A.T. (2004),‖Is RFID Right for Your Library‖, Journal of Access Services, Volume 2(4) 2013, pp 7-13.

[5] H. R. Babaei, O. Molalapata and A. A. Pandor, Face Recognition Application for Automatic Teller

Machines (ATM), in ICIKM, 3rd ed. vol.45, pp.211-216, 2013.

[6] Aru, O. Eze and I. Gozie, Facial Verification Technology for Use in ATM Transactions, in American Journal of Engineering Research (AJER), [Online] 2013, pp. 188-193, Available:http://www.ajer.org/papers/v2(5)/Y0250 1880193.pdf

[7] K. J. Peter, G. Nagarajan, G. G. S. Glory,V. V. S. Devi, S. Arguman and K. S. Kannan, Improving ATM Security via Face Recognition, in ICECT, Kanyakumari, 2013, vol.6, pp.373-376.

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IOT BASED DC SPPED AND DIRECTION CONTROL SYSTEM

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ABSTRACT:

DC motor plays very important role in different industries. In this review paper, we are discussing about a system which provides protection to the DC motor as well as helps in control and monitor various parameters. We have used ARDUINO ESP8266 wi-fi and web server also with the help of some transducers we can easily achieve our goal to protect and control the motor as well as to monitor various parameters. We have provided various controls through internet to avoid faults in DC motor. This project makes used of Atmega328, 8266 Wi-Fi modules and DC motor. The main zest of this paper is to controlled the speed of DC motor using IOT (Internet of Things).

Keywords: DC Motor, TELNET, IOT.

1. INTRODUCTION:

Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads-the template w DC motor were the first form of motor

widely used for industrial application. Small DC motors are also used in tools, toys and appliances. This motors is a class of rotary electrical machines that converts electrical energy into mechanical energy. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic to change the direction of current flow. DC motors are classified on the basis of their excitation configuration as follows. 1) Separately Excited DC motor 2) Self Excited DC motor a) Series DC motor b) Shunt wound DC motor c) Compound wound DC motor The basic working principle of DC motor is "Whenever a current carrying conductor is placed in a magnetic field, it experiences a mechanical force". The direction of this force is given by Fleming Left Hand Rule. The overall system based on IOT which is interrelated computing devices and ability to transfer data over a network without requiring human to human or human to computer interaction . The IOT evolved due to the convergence of multiple, machine learning and commodity sensors. In the consumer market,IOT technology is the most synonymous with products pertaining to the concept of the "Smart home" covering devices and appliances. IOT devices are part of the concept of home automation which can include lightening and air conditioning. This IOT based devices can be used to enable remote health monitoring and emergency notification system. The IOT can assist in the integration of communication, control and information processing across various transportation systems. Industrial IOT devices analyze data from connected equipment, operational technology, location and people. The IOT used for various manufacturing devices. It enable rapid manufacturing of new products and dynamic response to

product demands. The IOT application in farming such as collecting data on temperature, rainfall, humidity, wind speed and soil content. This data can be used to automate farming technique and take informed to improve quality and quantity. The IOT major significant trend in recent years is the growth of devices connected and controlled by the internet. The IOT creates opportunities for more direct integration of the physical world into computer-based system, resulting in efficiency improvements, economic benefits and reduced human exertion. The number of IOT devices increased from 31 % over year to 8.4 billion in the year 2017 and it is estimated that there will be 30 billion devices by 2020. The global market value of IOT projected to reach $ 7.1 trillion.

2. PREVIOUS STUDY:

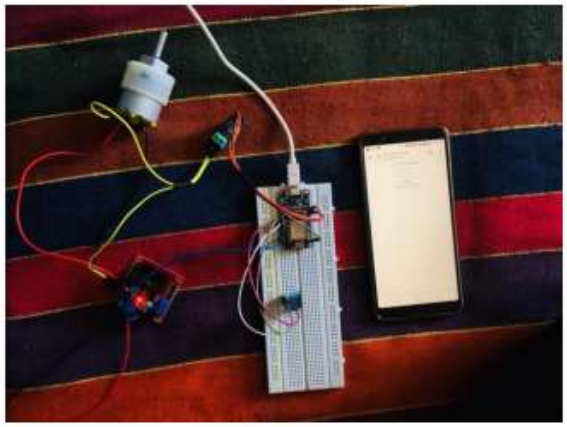
DC motors are very useful for various applications because of their wide range of speed control and relatively small size. In previous time for controlling or operating two or more motors the workers need to go to respective location where the motor is placed but with the help of this technology the operator can easily control all motors of the plant from a single control room[1]. Also for checking various parameters of motor like current and voltage we have to use measuring instrument but with the help of this project we can continuously monitor the parameters on a single computer screen [2]. Various faults like short circuit fault are very common in DC motors to avoid these fault our system provide protection to DC motor. In this review paper, we are working on a system which will provide protection of DC motor under faulty condition. Also we can monitor various conditions of motor by using this system. By this project we can reduce human efforts required for continuously checking the various

parameters of motor for an interval of time. Nowadays, IoT based embedded systems are used in various fields like technology, space, defense, research etc. So we have decided to use this system for protection, control and monitoring of DC motors. In various industries more than two DC motors are used for various applications so maintenance of those motors were a difficult task for the operators in the industry. But by the use of IoT based system any operator can check any motor's present status from the control room. He can record real time readings of various parameters like voltage, current and temperature by using IoT based system on a single computer screen. Also if he find any abnormal condition in any motor of the plant he can stop the motor from the control room by the use of IoT based system. Voltage Sensor Module is used measure the input voltage to motor and the data of this voltage sensor module is then transferred to computer or mobile screen in the control room by using IoT system. ACS712 Current Sensor Module and Temperature Sensor are used for the same operation as they measure current and temperature respectively.

3. PROPOSED SYSTEM:

The main methodology of this entire project depends on IoT based embedded system so interfacing of hardware's with wi-fi and internet is very important part in its functioning. The whole programming is done in arduino IDE and then load in the ATMEGA 328 microcontroller and with the help of wi-fi and various sensors. The required results will be done like providing protection to motor from the abnormal or faulty conditions. Observation of various parameters of motor like temperature, current and voltage will be achieved and also controlled direction of motion of motor with the help of relay and heat

developed in motor which is sense by temperature senor. Total functioning of project in terms of block diagram is shown in the Fig 1.



Wi-Fi Modules (8266): Wi-fi modules used as IOT device, which is connected to the website. The command coming from the website will send the signals to processor through wi-fi modules. Atmega 328: It is the heart of the system based on the processor ATMEGA 328. The Arduino IDE (Integrated Development Environment) will be used to program the speed control of DC MOTOR as well as wi-fi modules. Temperature Sensor: A temperature sensor is a device that provides for temperature measurement through an electrical signal. IR Sensor: An Infrared sensor is the actual sensor, it used to cut off the IR signal between transmitter and IR receiver. Relay: The processor give the signal to the relay to change the direction of the motor. LCD (Liquid Crystal Display): LCD connected to the processor it used to display the temperature of the motor as well as speed of the DC motor at rated value.

4. CONCLUSION:

This paper, introduced a system that can protect, control and monitor the speed of DC motor remotely with the help of Wifi modules and IOT based system. Protection against the over current and thermal overloading is done by current and temperature sensor. In this paper we propose a new architecture for the control system that uses a flexible industrial-based Android smartphone at a reasonable price and implemented by Ethernet shield and IBOARD

Arduino as well as using web domain for system control configuration. The proposed architecture is used in a web services for communication between the remote user and the industrial device. All Android-based smartphone, the Ethernet shield connection is the support built, the industry access device to control can use the phone, 3G or 4G to access the Web page on hosting server using Android App or web domain.

REFERENCES:

[1] Krishnan R, "Permanent magnet synchronous and brushless DC motor drives", Boca Raton: CRC Press, 2010

[2] S.Aydemir, S.Sezen, H.M., Ertunc, "Fuzzy logic speed control of a DC motor", IEEE, 4th International Power Electronics and Motion Control Conference (IPEMC), Vol. 2, PP. 766 – 771, August 2004.

[3] Akatsu K. and Kawamura A., (1999), —Sensor less very low and zero speed estimations with on-line secondary resistance estimation of induction motor without adding any signal‖, Proc. IEEE Ind. Applicant. Soc. Annual. Meeting, pp. 187–193.

[4] Ayman Sleman and Reinhard Moeller ``Integration of Wireless Sensor Network Services into other Home and Industrial networks "IEEE paper.

[5] H. A. Thompson, "Wireless and Internet communications technologies for monitoring and control", Control Engineering Practice, no. 12, pp. 781– 79, 2004

[6] "From today's INTRA net of things to a future INTER net of things: a wireless and mobility-related view" M.Zorzi, A.Gluhak, S.Lange, A.Bassi, IEEE Wireless Communications, 2010, Vol.17, Issue.6, pp.44- 51.

[7] Akatsu K. and Kawamura A., (1999), —Sensor less very low and zero speed estimations with on-line secondary resistance estimation of induction motor without adding any signal‖, Proc. IEEE Ind. Applicant. Soc. Annual. Meeting, pp. 187–193.

[8] Ayman Sleman and Reinhard Moeller ``Integration of Wireless Sensor Network Services into other Home and Industrial networks "IEEE paper.

[9] Rajeev Piyare and Seong Ro Lee`` Smart Home-Control and Monitoring System Using Smart Phone '' ICCA 2013, ASTL Vol. 24, pp. 83 - 86, 2013 © SERSC 2013.

[10] Jinsung Byun, Insung Hong, Byoungjoo Lee, and Sehyun Park, Member Intelligent Household LED Lighting System Considering Energy Efficiency and User Satisfaction, IEEE paper February 2013.

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LIGHT WEIGHT PRIVACY-PRESERVING MEDICAL DIAGNOSIS IN EDGE COMPUTING

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ABSTRACT:

With the development of machine learning, it is popular that mobile users can submit individual symptoms at any time anywhere for medical diagnosis. Edge computing is frequently adopted to reduce transmission latency for real-time diagnosis service. However, the data-driven machine learning, which requires to build a diagnosis model over vast amounts of medical data, inevitably leaks the privacy of medical data. It is necessary to provide privacy preservation. To solve above challenging issues, in this project, we design a lightweight privacy-preserving medical diagnosis mechanism on edge, called LPME. Our LPME redesigns the extreme gradient boosting (XG Boost) model based on the edge-cloud model, which adopts encrypted model parameters instead of local data to remove amounts of cipher text computation to plaintext computation, thus realizing lightweight privacy preservation on resource-limited edge. In addition, LPME provides secure diagnosis on edge with privacy preservation for private and timely diagnosis. Our security analysis and experimental evaluation indicates the security, effectiveness and efficiency of LPME.

Keywords:LPME, XG, Edge computing, Data.

1. INTRODUCTION:

Machine learning is taking an ever-increasing role in medical diagnosis, and has become prevalent for mobile users to submit symptoms at any time and then get diagnosis results. Compared with the shortage of experts and high cost in manual diagnosis, machine learning-based diagnosis has the great advantages in improving the quality of healthcare service and avoiding expensive diagnosis expenses. Thus, the construction of machine learning based medical

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diagnosis has attracted much attentions from both academic and industrial fields. With the emergence of telemedicine applications, more and more demands have blossomed in healthcare, clinical decision, and mobile telemedicine. However, the blossom has also been accompanied by various problems, i.e., the limitation of training data, vulnerabilities, and privacy concerns.In medical practice, it is a crucial issue that the collection of enough medical data is time-consuming and expensive. A single medical origination usually stores a limited number of medical data, which is hard to support the construction of data-driven machine learning. To train an accurate diagnosis model, it is necessary to share the training data distributed among various medical institutions. With the advances of extensive storage space and unlimited computing capacity in cloud computing, machine learning over outsourced medical data has been extensively studied with the adoption of cloud.

However, with the ever-increasing interactions between mobile users and the cloud, it incurs undesirable transmission latency and untimely request response. A delayed diagnosis response directly influences patients' life and health as well as medical safety, especially for patients with a diagnosis for acute disease (e.g., acute heart disease, pneumonia). To address this dilemma, edge computing, as a new computing paradigm, has been proposed to decrease latency and provide efficient computation service by using edge nodes which are close to mobile users. In the last few years, machine learning schemes based on edge computing have an extensive development, which is significant to improve the diagnosis efficiency with edge computing. Fig. 1 plots a typical edge network with several edge nodes (i.e., medical organizations) that owns restricted storage ability and limited computing power. To concentrate on the vulnerability in medical diagnosis, it is important to adopt a high-performance model on edge for real-time and reliable medical diagnosis.

Extreme gradient boosting (XG Boost) as the most state-of-the-art machine learning model enjoys the excellent prediction performance in the distributed setting, which demonstrates the outstanding ability in Kaggle competitions. Besides, with the tree-based structure, XG Boost has the advances of explain ability and ease of understanding. Therefore, there are a large number of schemes applied the XG Boost model for medical diagnoses , but they ignore the important issue of data privacy during the training phase. Actually, patients diagnosed with private diseases usually bear some psychological

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barrier when the diagnosis results are leakage to others. It is considered as a cause to worsen the condition. Thus, it is necessary to provide privacy reservation for them. Besides, the medical data contain a large amount of sensitive information, with there lease of privacy policies (i.e., GDPR and HIPPA),more and more data are forbidden to transform in the form of plain text. Therefore, it is urgent to protect privacy of medical diagnosis in the edge computing environment.

2. LITERATURE SURVEY

In medical practice, it is a crucial issue that the collection of enough medical data is time-consuming and expensive. A single medical origination usually stores a limited number of medical data, which is hard to support the construction of data-driven machine learning. To train an accurate diagnosis model, it is necessary to share the training data distributed among various medical institutions. With the advances of extensive storage space and unlimited computing capacity in cloud computing, machine learning over outsourced medical data has been extensively studied with the adoption

To concentrate on the vulnerability in medical diagnosis, it is important to adopt a high-performance model on edge for real-time and reliable medical diagnosis. Extreme gradient boosting (XG Boost) as the most state-of-the-art machine learning model enjoys the excellent prediction performance in the distributed setting, which demonstrates the outstanding ability in Kaggle competitions. Besides, with the tree based structure, XG Boost has the advances of explainability and ease of understanding. Therefore, there are a large number of schemes applied the XG Boost model for medical diagnoses [17], [18], [19], but they ignore the important issue of data privacy during the training phase. Actually, patients diagnosed with private diseases (e.g., HIV, Hepatitis B virus) usually bear some psychological barrier when the diagnosis results are leakage to others. It is considered as a cause to worsen the condition. Thus, it is necessary to provide privacy preservation for them. Besides, the medical data contain a large amount of sensitive information, with the release of privacy policies (i.e., GDPR [20] and HIPPA [21]), more and more data are forbidden to transform in the form of plaintext. Therefore, it is urgent to protect privacy of medical diagnosis in the edge computing environment.

Proposed System

To address the above challenges, we design a lightweight privacy-preserving XGBoost over

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encrypted model parameters to greatly lighten computational overhead, compared with data sharing-based privacy-preserving machine learning. In this paper, we present the Lightweight Privacy preserving Medical diagnosis in Edge computing, which is termed as LPME. Specifically, our LPME mainly has the following constructions:

Lightweight XGBoost on edge: LPME system constructs a XGBoost-based diagnosis model with model parameters trained over multiple edge nodes rather than training data, which not only eliminates the drawbacks of burdensome training data storage, but also guarantees the feasibility of XG Boost. Privacy-preserving training: LPME system designs HE based secure computation with a single-cloud model, which selects optimal parameters over encrypted model parameters during the training phase. Since the secret key is randomly split into two parts, only one is stored in the single cloud. Thus, the single cloud model can not only provide strong privacy preservation for training the lightweight XG Boost, but also guarantee the reliability of the privacy preserving training on the resource-limited edges. Secure diagnosis on XG Boost at edge: LPME system provides secure diagnosis, in which a mobile user can submit his/her encrypted requests to an edge, then the edge will return the corresponding diagnosis results. During the process, HE is adopted to guarantee confidentiality of the returned diagnosis results for implementing the private and timely diagnosis.

3. METHODOLOGY

Here, we introduce the Secure Multiplication (SMUL) and Secure Comparison (SCOM) operations for secure computation. Suppose that there are two semi-honest parties (i.e., Alice and Bob) in the multiplication and comparison over encrypted data, the goals of SMUL and SCOM are that all intermediate results and final computation results cannot be disclosed to both parties. Given two encrypted numbers [[x1]] and [[x2]], Alice holds a secret share sk(1), Bob holds the other secret share sk(2) . SMUL and SCOM are defined as follows:

SMUL([[x1]], [[x2]]) → [[x1 × x2]]: Alice first generates [[x 0 1]] = [[x1]] · [[r1]], [[x 0 2]] = [[x2]] · [[r2]], where r1, r2 ∈ Z ∗ η2 are two random numbers, then uses SDecsk(1) to obtain [[x 0 1]](1) and [[x 0 2]](1). On receiving these encrypted data, Bob uses SDec and WDec with sk(2) to obtain x 0 1 and x 0 2 , and computes [[res]] = x 0 1 × x 0 2 . Then, Alice runs [[x1 × x2]] = [[res]] · [[r1 × r2]]η−1 ·[[x1]]η−r2

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·[[x2]]η−r1 to remove random numbers, and the multiplication result [[x1 × x2]] is returned.

SCOM([[x1]], [[x2]]) → res: Alice first calculates [[x 0 1]] = [[x1]]2 · [[1]], [[x 0 2]] = [[x 0 2]]2 · [[1]], and runs [[res]] ← ([[x 0 1]] · [[x 0 2]]η−1) r1 · [[r2]], where r1, r2 ← Zη (r2 r1) are two random numbers. Then, [[res]](2) ← SDecsk(1) ([[res]]) is obtained.

After involving the SDec and WDec algorithms, Bob obtains res via computing the bit length of res as Eq. 3, and returns the comparison result. res = x1 < x2, |res| > |η|/2; x1 ≥ x2, otherwise. (2)

Algorithm 2

Algorithm 2: Globally Optimal Split

Input: Encrypted gain parameters {[[α↑n]], [[α↓n]]}Nn=1,encrypted locally optimal split {[[s∗n]], [[f∗n]]}Nn=1.

Output: Globally optimal split f∗and s∗.

1 [[score↑]] ← [[0]], [[score↓]] ← [[1]];

2 f∗ ← [[0]], [[s∗]] ← [[0]];

3 for 0 < n ≤ N do

4 /* Compare Enc Index */

[[score↑ × α↓n]] ← SMUL([[score↑], [[a↓n]]);

5 [[score↓ × α↑n]] ← SMUL([[score↓]], [[α↑ n]]);

6 SCOM([[score↑ × α↓n]] · [[score↓ × α↑n]]η−1, [[0]]);

7 if A − B < 0 then

8 score↑ ← α↑n, score↓ ← α↓n;

9 [[f∗] ← [[f∗n]], [[s∗]] ← [[s∗n]];

10 return [[f∗]], [[s∗]].

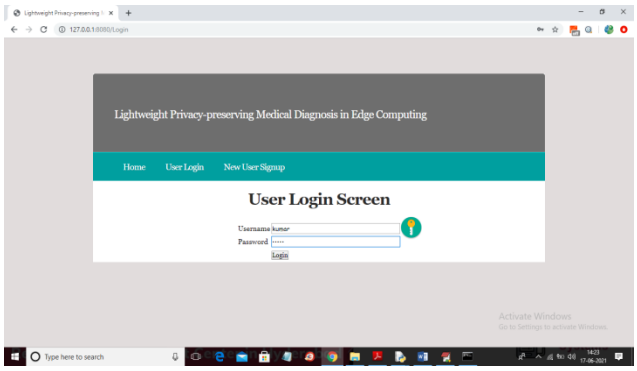

Fig 3.1 User Login Page.

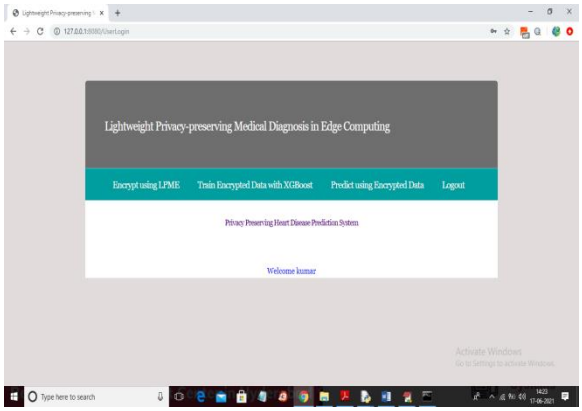

Fig 3.2 Login Success Page

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In above screen you can click on 'Encrypt using LPME' link to encrypt dataset with LPME technique.

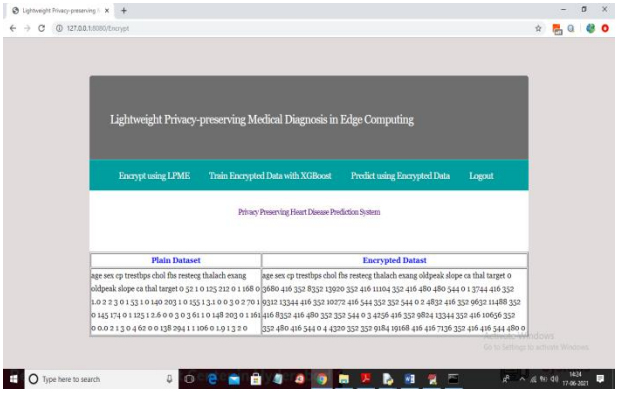

Fig 3.3 Encrypted data

In above screen first column showing original dataset and second column showing encrypted format of that original plain data and now dataset is encrypted and now click on 'Train Encrypted Data with XG Boost' link to train dataset and to build XGBOOST secure disease prediction model

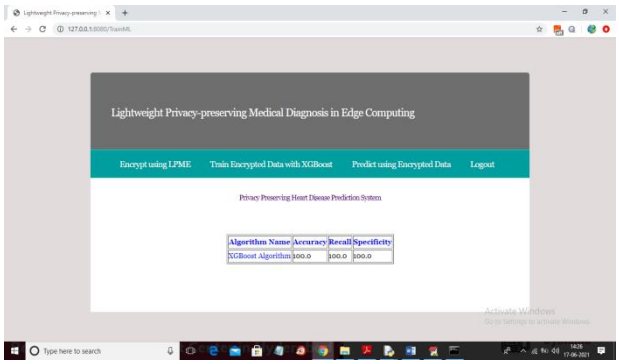

Fig 3.4 Data Prediction

In above screen XGBOOST training completed and we got accuracy of the model on test data is 100% and in below screen you can training and testing of XGBOOST

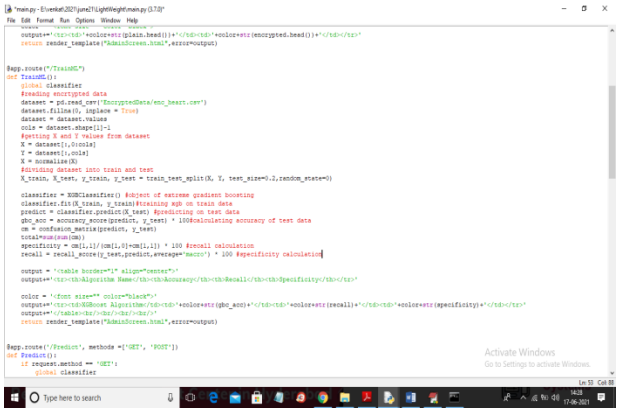

Fig 3.5XGBoost training on encrypted data

In above screen, the code is used to create XGBOOST training on encrypted data and now go back to previous application and click on 'Predict Using Encrypted Data' link to predict disease from new test data and below is the test data screen

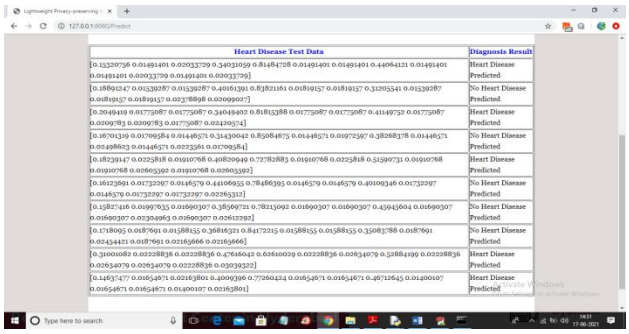

Fig 3.6 Result Analysis

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In above screen in first column you can see then encrypted test data and in second column you can see prediction result as 'No Heart Disease Detected' or 'Heart Disease Detected'

CONCLUSION

This project has proposed a lightweight privacy-preserving XG Boost framework on edge, which could not only provide lightweight XG Boost over edge nodes with strong privacy preservations, but also achieve privacy-preserving and real-time medical diagnosis on edge. The proposed LPME system with secure computation could securely construct XG Boost model with lightweight overhead, and efficiently provide medical diagnosis without privacy leakage. Experimental results over real-world datasets verified the efficiency and security of the LPME system on edge computing.

FUTURE SCOPE

As we normally use automatic rapid test for detecting the malaria a person can know the status of malaria using strips in rapid test as we do test of malaria we can also use a method to send the details of a patient as he/she was infected or not to the patient mobile and let the patient know the details of him/her through what's app or message. We can also send the appointment to meet the doctor.

Firstly, we create a excel sheet which has patient details and send the details to the person directly without any delay. There will be no waiting of patient. The patient receives the message of the test directly with a message and the patient also receives appointment to meet doctor at a specific time and date. It becomes to the patient and doctor to meet and discuss.

For this, we use visual studio management to create a message and send the message to the patient. Visual studio plays a major role to create a message and send it to the person. The details of a person which we need to send is already placed in excel sheet. So, it becomes easy to send to person and allot appointment to the patient.

REFERANCES

[1] X. Wang, J. Ma, Y. Miao, X. Liu, and R. Yang, "Privacy-preserving diverse keyword search and online pre-diagnosis in cloud computing," IEEE Transactions on Services Computing, 2019.

[2] Y. Zhang, C. Xu, H. Li, K. Yang, J. Zhou, and X. Lin, "Health Deep: An efficient and secure duplication scheme for cloud-assistede health systems," IEEE Trans. Industrial Informatics, vol. 14, no. 9,pp. 4101–4112, 2018.

[3] B. Fu, P. Liu, J. Lin, L. Deng, K. Hu, and H. Zheng, "Predicting invasive disease-free survival

for early-stage breast cancer patients using follow-up clinical data," IEEE Transactions on Biomedical Engineering, 2018.

[4] A. Galletta, L. Carnevale, A. Bramanti, and M. Fazio, "An innovative methodology for big data visualization for telemedicine, "IEEE Transactions on Industrial Informatics, vol. 15, no. 1, pp. 490497, 2018.

[5] I. Kononenko, "Machine learning for medical diagnosis: history state of the art and perspective," Artificial Intelligence in medicine, vol. 23, no. 1, pp. 89–109, 2001.

[6] C. P. Friedman, A. K. Wong, and D. Blumenthal, "Achieving anation wide learning health system," Science Translational Medicine, vol. 2, no. 57, pp. 57cm29–57cm29, 2010.

[7] Y. Miao, X. Liu, K.-K. R. Choo, R. H. Deng, H. Wu, and H. Li, "Fairand dynamic data sharing framework in cloud-assisted internet of everything," IEEE Internet of Things Journal, 2019.

[8] Y. Miao, Q. Tong, K.-K. R. Choo, X. Liu, R. H. Deng, and H. Li,"Secure online/offline data sharing framework for cloud-assisted industrial internet of things," IEEE Internet of Things Journal, 2019.

[9] Y. Miao, J. Weng, X. Liu, K.-K. R. Choo, Z. Liu, and H. Li, "Enabling verifiable multiple keywords search over encrypted cloud data, "Information Sciences, vol. 465, pp. 21–37, 2018.

[10] T. Ouyang, R. Li, X. Chen, Z. Zhou, and X. Tang, "Adaptive user-managed service placement for mobile edge computing: A non line learning approach," in Proc. IEEE Conference on Computer Communications (INFOCOM'19). IEEE, 2019, pp. 1468–1476.

[11] P. Dai, K. Liu, X. Wu, H. Xing, Z. Yu, and V. C. Lee, "A learning algorithm for real-time service in vehicular networks with mobile edge computing," in Proc. IEEE International Conference on Communications (ICC'19). IEEE, 2019, pp. 1–6.

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MOUSE CURSOR CONTROL WITH EYEBALL USING MACHINE LEARNING

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ABSTRACT:

There are different reasons for which people need an artificial of locomotion such as a virtual keyboard. The number of people, who need to move around with the help of some article means, because of an illness. Moreover, implementing a controlling system in it enables them to move without the help of another person is very helpful. The idea of eye controls of great use to not only the future of natural input but more importantly the handicapped and disabled. Camera is capturing the image of eye movement. First detect pupil center position of eye. Then the different variation on pupil position get different command set for virtual keyboard. The signals pass the motor driver to interface with the virtual keyboard itself. The motor driver will control both speed and direction to enable the virtual keyboard to move forward, left, right and stop.

Key words: eye movement, virtual keypad, artificial of locomotion.

I INTRODUCTION

Nowadays, personal computer systems take a vast part in our day to day survival since they are used in areas such as at workplace etc. These applications have one thing in common i.e. the use of personal computers is mostly dependant on the data input methods such as mouse. But this is not a problem in case of a healthy individual, this may be a problem for people with less freedom of movement of their limbs [1]. In such cases, it might be preferable to use input methods which supports the abilities of the region such as eye movements. To enable such input method as a substitute, a system is designed which follows a low-cost approach to control cursor on a computer system without the use of mouse [6]. In the proposed system, the cursor movement of the computer system is controlled by the eyeball movement using OpenCV. This system comprises of Raspberry pi [5]. It is interfaced with IP camera which detects the Eyeball movements and based on these eyeball movements the cursor can be controlled accordingly which are processed using the Open CV (Open Computer Vision).Nowadays personal computer systems are carrying a huge part in our everyday lives as they are used in areas such as work, education and enjoyment. What all these applications have in common is that

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the use of personal computers is mostly based on the input method via keyboard and mouse. While this is not a problem for a healthy individual, this may be an insurmountable bound for people with limited freedom of movement of their limbs. In these cases it would be preferable to use input methods which are based on more abilities of the region such as eye movements. To enable such substitute input methods a system was made which follows a low-price approach to control a mouse cursor on a computer system. The eye tracker is based on images recorded by a mutated webcam to acquire the eye movements. These eye movements are then graphed to a computer screen to position a mouse cursor accordingly. The movement of mouse by automatically adjusting the position of eyesight. Camera is used to capture the image of eye movement. In general, any digital image processing algorithm consists of three stages: input, processor and output. In the input stage image is captured by a camera. It sent to a particular system to focus on a pixel of image that's gives, its output as a processed image. Embedded system is combination of hardware and software.An embedded system can be an independent system or it can be a part of a large system. An embedded system is a microcontroller or microprocessor based system which is designed to perform a specific task. For example, a fire alarm is an embedded system; it will sense only smoke Python is a high-level language. This means that Python code is written in largely recognizable English, providing the Pi with commands in a manner that is quick to learn and easy to follow. This is in marked contrast to low-level languages, like assembler, which are closer to how the computer ―thinks‖ but almost impossible for a human to follow without experience.

2. RELATED STUDY

There are two components to the human visual line-of-sight: pose of human head and the orientation of the eye within their sockets. Investigated these two aspects but will concentrate on the eye gaze estimation in this concpt. The present of novel approach called the ―one-circle‖ algorithm for measuring the eye gaze using a monocular image that zooms in on only one eye of a person. Observing that the iris contour is a circle, Estimate the normal direction of this iris circle, considered as the eye gaze, from its elliptical image. From basic projective geometry, an ellipse can be back-projected into space onto two circles of different orientations. However, by using a geometric constraint, namely, that the distance between the eyeball's center and the two eye corners should be equal to each other, the correct solution can be disambiguated. This allows us to obtain a higher resolution image of the iris with a zoom-in camera, thereby achieving higher accuracies in the estimation. A general approach that combines head pose determination with eye gaze estimation is also proposed. The searching of the eye gaze is guided by the head pose information. The robustness of our gaze determination approach was verified statistically by the extensive experiments on synthetic and real image data. The two key contributions in this concept are that show the possibility of finding the unique eye gaze direction from a single image of one eye and that one can obtain better accuracy as a

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consequence of this. The first technique is proposed to estimate the 3-D eye gaze directly. In this technique, the cornea of the eyeball is modelled as a convex mirror. Via the properties of convex mirror, a simple method is proposed to estimate the 3-D optic axis of the eye. The visual axis, which is the true 3-D gaze direction of the user, can be determined subsequently after knowing the angle deviation between the visual axis and optic axis by a simple calibration procedure. Therefore, the gaze point on an object in the scene can be obtained by simply intersecting the estimated 3-D gaze direction with the object. In addition, a dynamic computational head compensation model is developed to automatically update the gaze mapping function whenever the head moves. Hence, the eye gaze can be estimated under natural head movement. Furthermore, it minimizes the calibration procedure to only one time for a new individual. The advantage of the proposed techniques over the current state of the art eye gaze trackers is that it can estimate the eye gaze of the user accurately under natural head movement, without need to perform the gaze calibration every time before using it. Our proposed methods will improve the usability of the eye gaze tracking technology, and believe that it represents an important step for the eye tracker to be accepted as a natural computer input device.

3 METHODOLOGY

4 The user has to sits in front of the display screen of private computer or pc, a specialised video camera established above the screen to study the consumer's eyes. The laptop constantly analysis the video photo of the attention and determines wherein the consumer is calling at the display screen. not anything is attached to the consumer's head or body. To "pick out" any key, the user seems at the key for a exact period of time and to "press" any key, the consumer just blink the eye. On this device, calibration procedure is not required. For this system enter is simplest eye. No outside hardware is connected or required. Camera gets the input from the eye. After receiving these streaming movies from the cameras, it'll spoil into frames. After receiving frames, it will check for lights conditions because cameras require enough lighting fixtures from external sources in any other case blunders message will show at the screen. The captured frames which can be already in RGB mode are transformed into Black 'n' White. Five. Pics (frames) from the enter supply focusing the eye are analysed for Iris detection (middle of eye).

4 RESULTS EXPLANATION

The current android application is developed using Xml, Java, SQL with Firebase connectivity. It can be used by every individual who are in a need of fulfilling their household services.

At the time of submission of my application was capable of doing the following:

- Displaying thehome screen with different fragments.
- Authentication of user by using login screen using Firebase.
- Home screen to display based on user or service provider.
- After successful login of user, they can choose the service and book a slot of their particular service provider from the displayed list.

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- Add, update, view, delete the user details.
- After successful login of service provider, they can view all the bookings that are booked by the users and can attend them one by one.
- Service provider can also set his preferences to not available, if he's too busy or many users had already booked him.
- Service provider has the ability to change their particular radius of location for servicing.
- He can set up to 10 km radius.
- Logout and end the session.

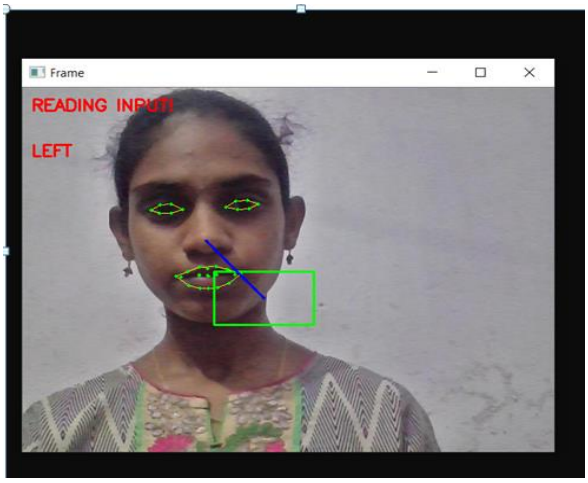

Fig.4.1. OUTPUT results.

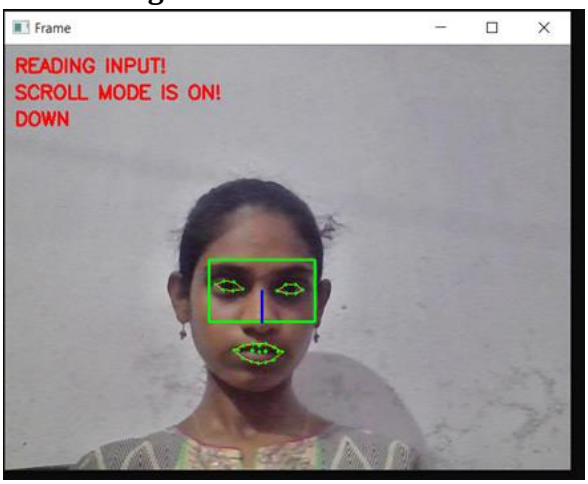

Fig.4.2. Detection of Eyeball.

CONCLUSION

First detect pupil center position of eye. Then the different variation on pupil position get different command set for virtual keyboard. The signals pass the motor driver to interface with the virtual keyboard itself. The motor driver will control both speed and direction to enable the virtual keyboard to move forward, left, right and stop.

REFERANCES

[1].Brooks,R.E.(1997) ―Towards a theory of the cognitive processes in computer programming,‖ Int. J. Man-Mach. Studies, vol. 9, pp. 737–751.

[2].Cheng- Chih Wu, Ting-Yun Hou(2015)‖Tracking Students' Cognitive Processes During Program Debugging‖—An Eye-Movement Approach, IEEE.

[3].Ehrlich,K. and Soloway,E.(1983) ―Cognitive strategies and looping constructs: An empirical study,‖ Commun. ACM, vol. 26, no. 11, pp. 853–860.

[4].Eric Sung and Jian-Gang Wang (2002)―Study on Eye Gaze Estimation‖, IEEE, VOL. 32, NO. 3, JUNE .

[5].Murphy,L. (2008)―Debugging: The good, the bad, and the quirky—A qualitative analysis of novices' strategies,‖ SIGCSE Bull., vol. 40, no. 1, pp. 163–167.

[6].QiangJi and Zhiwei Zhu (2007)‖Novel Eye Gaze Tracking Techniques Under Natural Head Movement‖, Senior Member, IEEE, VOL. 54, NO. 12, DECEMBER .

[7].Rajlich,V. and Xu,S.(2004) ―Cognitive process during program debugging,‖ in Proc. 3rd IEEE ICCI, pp. 176– 182.

[8].Renumol,V.(2009) ―Classification of cognitive difficulties of students to learn computer programming,‖ Indian Inst. Technol. India.

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

[9].Seung-Jin Baek and Young-Hyun Kim(2013)‖Eyeball Model-based Iris Center Localization for Visible Imagebased Eye-Gaze Tracking Systems‖,IEEE.

[10].Tianchi Liu, Yan Yang.Driver (2015)‖Distraction Detection Using Semi-Supervised Machine Learning‖, IEEE.

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Survey and Applications of Leach Protocol

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ABSTRACT

Even after 16 years of existence, low energy adaptive clustering hierarchy (LEACH) protocol is still gaining the attention of the research community working in the area of wireless sensor network (WSN).This itself shows the importance of this protocol. Researchers have come up with various and diverse modifications of the LEACH protocol. Successors of LEACH protocol are now available from single hop to multi hop scenarios. Extensive work has already been done related to LEACH and it is a good idea for a new research in the field of WSN to go through LEACH and its variants over the years. This paper surveys the variants of LEACH routing protocols proposed so far and discusses the enhancement and working of them. This survey classifies all the protocols in two sections, namely, single hop communication and multi hop communication based on data transmission from the cluster head to the base station. A comparitive analysis using nine different parameters, such as energy deficiency, overhead, scalability complexity, and so on, has been provided in a chronological fashion. The article also discusses the strong and the weak points of leach

Keywords : LEACH, BS,WSN, Nodes, BS,Routing

INTRODUCTION

A Wireless Sensor Network (WSN) is a collection of large numbers of sensor nodes with limited sensing, computing and communication capabilities. These sensors are deployed over a large area with one or more than one Base Station (BS).WSN has wide application possibilities, such as temperature ,pressure, humidity and habitat monitoring, disaster management, military reconnaissance, forest fire tracking, security surveillance and many more [1]–[3]. In most scenarios, sensor nodes are randomly deployed with limited battery power. The selection of routing techniques is an important issue for the efficient delivery of sensed data from its source to the destination. The routing strategy used in these type of networks should ensure minimum energy consumption as battery replacement in sensors are often not possible. A lot of energy efficient routing protocols have been proposed and developed for WSN, depending on their application and network architecture. Designing a routing protocol is full of challenges, mainly due to limited power, low bandwidth, low computational power, no conventional addressing scheme, computational overheads and self organization of the sensor nodes. According to Pantazis et al. [4], routing protocols can be classified in four schemes: Network Structure Scheme, Topology Based Scheme, Communication Model Scheme and Reliable Routing Scheme. Further based on the deployment of nodes in the network, the network structure schemes can be divided into two types: Flat routing and Hierarchical routing. In flat routing protocols, all sensor nodes play identical roles and functionalities in the network. The main problem of these types of networks is scalability as they are used for small area networks. Since this paper provides a survey on LEACH and its variants, our discussions will be limited to hierarchical routing protocols. Hierarchical routing provides better energy efficiency and scalability due to its architecture. In this type of protocol, the whole network is divided into clusters and some nodes are chosen as special nodes based on certain criteria. These special nodes called cluster heads (CHs) collect, aggregate and compress the information received from neighbour nodes, and finally transmit the compressed information to the BS. The CH provides additional services to other nodes in the cluster and hence consumes more energy as compared to other nodes of the cluster. Cluster rotation is a common method deployed to balance the energy dissipation within a cluster. The first hierarchical routing protocol was proposed by Heinzelman et al. [9]known as LEACH. In LEACH, clusters are formed on the basis of the strength of the signal received by the sensor

Advantages Of Leach

LEACH is a complete distributed routing protocol in nature .Hence, it does not require global information. The main advantages of LEACH include the following:

1) clustering concept used by LEACH protocol enforces less communication between sensor nodes and the BS, which increases the network lifetime.
2) CH reduces correlated data locally by applying data aggregation technique which red reduces significant amount of energy .

3) Assigning a TDMA schedule to a member node via CH allows the member node to enter standby mode. This prevents collisions in the cluster and prolongs the battery life of the Sensor Node..
4)LEACH protocol gives equal chance to every sensor node to become the CH at least once and to become a member node many Time through its lifetime this randomized rotation of CH enhances network lifetime.

Disadvantages Of Leach
However, there exist some disadvantages in LEACH which are as follows:

In each round the CH is chosen randomly and the probability of becoming the CH is the same for each sensor node. After completion of some rounds, the probability
of sensor nodes with high energy as well as low energy becoming the CH is the same. If the sensor node with less energy is chosen as the CH, then it dies quickly. Therefore, robustness of the network is affected and lifetime of the network degrades.

LEACH does not guarantee the position and number of CHs for each shift. The formation of clusters in LEACH is inherently random, leading to an uneven distribution of clusters within the network. Also, in some clusters, the CH location may be across the cluster, and in some clusters, the CH location may be close to the cluster boundaries. As a result, communication within the cluster in these situations results in high power loss and poor overall sensor network performance..

LEACH follows the one-step communication between CH and BS. The CHs further away from the BS consume more energy than the CHs closest to the BS when the detection area exceeds a certain distance. This leads to uneven power dissipation and ultimately the shortens the life of the sensor array**.**

Parameters Of Leach
Round Length
The number of Rounds is considered as an important factor in LEACH and its variants but all these protocols remain quiet on round length. One complete round consists of cluster formation, CH selection and data transmission phases. In one round all sensor nodes of the WSN transfer their sensed data to the BS through different phases. The total time taken in a complete round is called round length. The number of Rounds is also considered as a powerful parameter for performance measurement in WSN. TBLEACH [ ] and Variable Round LEACH (VRLEACH) [66] protocols have used time factor for CH selection and variable round time respectively but round length is not clearly discussed. Hence, finding the optimal round length is an open challenge in LEACH and its variant

3d Scenarios
Most of the real world applications are related to 3D scenarios, even though sensor nodes are usually deployed on a 2D surface. Underwater WSN based LEACH WSN and LEACHL are proposed using the hierarchical clustering techniques for underwater WSN. The main challenge in 3D UWSN is to manage mobile nodes moving with the ocean currents. The major issues that need to be considered while designing a UWSN are extreme water conditions, hardware constraints, transmission issues, etc. However, clustering techniques are not fully exploited in the 3D environment due to their highly sparse deployment and this provides a great challenge for the researchers to design a better protocol.

Mobility
Mobility is an important open research issue for investigating the effect of mobile nodes in hierarchical clustering routing or LEACH related protocols. In clustering, all three parts of the network, non CH nodes, the CH node and the BS, can be mobile. Lotfinezhad et al. [10] have investigated the effect of a mobile BS in a clustering based WSN. Another valuable analysis supports the non CH and CH. Both the mobile and least mobile nodes are selected as CH. The network topology changes and control packets overhead due to mobile nodes are the major challenges to handle. Cluster formation and stable time for estimation of link establishment time are also very challenging tasks.

E. Scalability
LEACH is not effective for large networks because the CH communicates directly with the BS. In large networks, one-step communication uses a higher radio range and consumes more battery. To minimize this professional

Security
Incorporating security in LEACH based protocols is a difficult task due to the lack of resources in a sensor node. Existing solutions for wireless ad hoc networks are not relevant here. Like other protocols, LEACH is at high risk of security attacks including spoofing, replay, hello flood, sybil etc. Since it is a cluster based protocol, CHs are the first target for attackers due to the potential for most damage. The CHs should perform the security protocols and data acquisition and at the design level data link layer encryption and authen tication should be considered

Fault Tolerance Management

Fault tolerance is one of the most important issues in LEACH and its variants This is due to a time alignment error. WSN. sensor nodes are distributed in a harsh, unstaffed environment, so failure of node components is almost vitable. With cluster-based protocols, CH failure directly affects member nodes, causing greater damage to the network. Describe this problem and try to resolve it using the efficient elimination method in . LEACH T [6] was developed to improve network reliability and fault tolerance and reduce energy consumption. One of the main challenges in managing fault tolerance is the detection and recovery of errors. The implementation of fault tolerance schemes in LEACH and related protocols has several characteristics.

FINDING & CONCLUSION

The findings of this survey show that protocols are distributed in nature and require location information. Finding location coordinates through either GPS device or localization techniques is expensive and it consumes a significant amount of energy. Multi hop clustering routing protocols suffer from more overheads and delay due to path setup and relay nodes as compared to single hop clustering routing protocols. Only few protocols have considered the consumption of energy during the CH selection and cluster formation in their simulation. In CH selection, energy is an important parameter but apart from this, researchers have considered many other parameters for it such as location of the node, node density, distance from the BS, mobility, energy harvesting nodes, optimal number of CHs etc. Security is a major concern as WSN is also used in military and hostile scenarios. Most of the proposed protocols for security in WSN are doing so at the expense of energy efficiency as there is a trade off between security and energy efficiency. Hence, it is challenging to improve both energy efficiency and security at the same time .In recent years deterministic clustering approaches have gained more popularity in WSN as they are more reliable than probabilistic clustering approaches. LEACH has been a creative field of research over the years. LEACH related protocols discussed in this paper offer a promising improvement over conventional LEACH; however, there is still much room for developing convenient and efficient . LEACH variants

REFERENCES

[1] Akyildiz, I.F.; Weilian, S.; Sankarasubramaniam, Y.; Cayirci, E. A survey on sensor networks. IEEE Commun. Mag. 2002, 40, 102–114. [CrossRef]
[2] Anastasi, G.; Conti, M.; Di Francesco, M.; Passarella, A. Energy conservation in wireless sensor networks: A survey. Ad Hoc Netw. 2009, 7, 537–568. [CrossRef]
[3] Raghunathan, V.; Schurgers, C.; Park, S.; Srivastava, M. Energy-aware wireless microsensor networks. IEEE Signal Process. Mag. 2002, 19, 40–50. [CrossRef]
[4] Chowdhury, S.; Hossain, A. Different Energy Saving Schemes in Wireless Sensor Networks: A Survey. Wirel. Pers. Commun. 2020, 114, 2043–2062. [CrossRef]
[5] Singh, J.; Kaur, R.; Singh, D. A survey and taxonomy on energy management schemes in wireless sensor networks. J. Syst. Archit. 2020, 111. [CrossRef]
[6] Singh, J.; Kaur, R.; Singh, D. Energy harvesting in wireless sensor networks: A taxonomic survey. Int. J. Energy Res. 2020. [CrossRef]
[7] Engmann, F.; Katsriku, F.A.; Abdulai, J.; Adu-Manu, K.S.; Banaseka, F.K. Prolonging the Lifetime of Wireless Sensor Networks: A Review of Current Techniques. Wirel. Commun. Mob. Comput. 2018, 2018. [CrossRef]
[8] Yetgin, H.; Cheung, K.; El-Hajjar, M.; Hanzo, L. A Survey of Network Lifetime Maximization Techniques in Wireless Sensor Networks. IEEE Commun. Surv. Tutor. 2017, 19, 828–854. [CrossRef]
[9] Yadav, S.; Yadav, R. A review on energy efficient protocols in wireless sensor networks. Wirel. Netw. 2016, 22, 335–350. [CrossRef]
[10] Rault, T.; Bouabdallah, A.; Challal, Y. Energy efficiency in wireless sensor networks: A top-down survey. Comput. Netw. 2014, 67, 104–122. [CrossRef]
[11] Cui, S.; Goldsmith, A.; Bahai, A. Energy-constrained modulation optimization. IEEE Trans. Wirel. Commun. 2005, 4, 2349–2360. [CrossRef]
[12] Rosas, F.; Oberli, C. Modulation and SNR optimization for achieving energy-efficient communications over short-range fading channels. IEEE Trans. Wirel. Commun. 2012, 11, 4286–4295. [CrossRef]
[13] Gumusalan, A.; Simon, R.; Aydin, H. Dynamic modulation scaling enabled multi-hop topology control for time critical wireless sensor networks. Wirel. Netw. 2020, 26, 1203–1226. [CrossRef]
[14] Nosratinia, A.; Hunter, T.E.; Hedayat, A. Cooperative communication in wireless networks. IEEE Commun. Mag. 2004, 42, 74–80. [CrossRef]
[15] Li, Q.; Hu, R.Q.; Qian, Y.; Wu, G. Cooperative communications for wireless networks: Techniques and applications in LTEadvanced systems. IEEE Wirel. Commun. 2012, 19, 22–29. [CrossRef]
[16] Shuguang, C.; Goldsmith, A.J.; Bahai, A. Energy-efficiency of MIMO and cooperative MIMO techniques in sensor networks. IEEE J. Sel. Areas Commun. 2004, 22, 1089–1098. [CrossRef]
[17] Soorki, M.; Manshaei, M.; Maham, B.; Saidi, H. On uplink virtual MIMO with device relaying cooperation enforcement in 5G networks. IEEE Trans. Mob. Comput. 2018, 17, 155–168. [CrossRef]

[18] Song, L.; Chai, K.; Chen, Y.; Loo, J.; Jimaa, S.; Iraqi, Y. Energy efficient cooperative coalition selection in cluster-based capillary networks for CMIMO IoT systems. Comput. Netw. 2019, 153, 92–102. [CrossRef]
[19] Singh, M.; Amin, S. Energy-efficient data transmission technique for wireless sensor networks based on DSC and virtual MIMO. ETRI J. 2020, 42, 341–350. [CrossRef]
[20] Peng, Y.; Al-Hazemi, F.; Kim, H.; Youn, C.H. Design and Optimization for Energy-Efficient Cooperative MIMO Transmission in Ad Hoc Networks. IEEE Trans. Veh. Technol. 2017, 66, 710–719. [CrossRef]
[21] Peng, Y.; Al-Hazemi, F.; Boutaba, R.; Tong, F.; Hwang, I.; Youn, C. Enhancing Energy Efficiency via Cooperative MIMO in Wireless Sensor Networks: State of the Art and Future Research Directions. IEEE Commun. Mag. 2017, 55, 47–53. [CrossRef]
[22] Peng, Y.; Li, J.; Park, S.; Zhu, K.; Hassan, M.; Alsanad, A. Energy-efficient cooperative transmission for intelligent transportation systems. Future Gener. Comput. Syst. 2019, 94, 634–640. [CrossRef]
[23] Correia, L.H.; Macedo, D.F.; dos Santos, A.L.; Loureiro, A.A.; Nogueira, J.M.S. Transmission power control techniques for wireless sensor networks. Comput. Netw. 2007, 51, 4765–4779. [CrossRef]
[24] Fernandes, D.; Ferreira, A.; Abrishambaf, R.; Mendes, J.; Cabral, J. Survey and taxonomy of transmissions power control mechanisms for wireless body area networks. IEEE Commun. Surv. Tutor. 2018, 20, 1292–1328. [CrossRef].

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NETWORK TRAFFIC ANALYSIS USING MACHINE LEARNING

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ABSTRACT:

In the world of networking, it sometimes becomes essential to know what types of applications flow through the network for performance of certain tasks. Network traffic classification sees its main usage among ISP's to analyze the characteristics required to design the network and hence affects the overall performance of a network. There are various techniques adopted to classify network protocols, such as port-based, pay-load based and Machine Learning based, all of them have their own pros and cons. Prominent nowadays is Machine Learning technique due to its vastness in usage in other fields and growing knowledge among researchers of its better accuracy among others when compared. In this paper, we compare two of the basic algorithms, Naïve Bayes and K nearest algorithm results when employed to networking data set extracted from live video feed using Wireshark software. For an implementation of Machine learning algorithm, python sklearn library is used with numpy and pandas library used as helper libraries. Finally, we observe that K nearest algorithm gives more accurate prediction than Naïve Bayes Algorithm, Decision Tree Algorithm and Support Vector Machine.

Keywords: ML, K NN, traffic, wire shark, basic algorithm.

1. INTRODUCTION:

The Network Traffic Classification plays a dynamic role pertaining to threats associated with the emerging technology nowadays. The various machine learning based classification techniques are presented in [1]. It helps internet service providers to manage overall performance of the network by considering the factors associated with certain application protocol. It has its usage in recognizing the unknown network if any tries to intrude the specified traffic lane. By this way we get to study its properties as well. Using the above property of recognizing unknown network, one can also recognize the potential threats that a network can suffer due to certain security attacks. Management of network security and Quality of Service (QoS) is also essential task and can be achieved if we have good techniques to classify network. Blocking or allowance of certain network traffic can also be achieved if we classify our network well. Overall, classification of network helps in overall growth of the network and its efficiency. The second technique that come into existence is Payload based technique in which packets of the associated networks are used to analysis and according to them protocol is identified. This technique is known as Deep Packet Inspection

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technique due to the fact that it uses packets for analysis. This technique is failed primarily due to the fact that it requires costly hardware installations and this does not work well for the packets that are encrypted. These drawbacks give the way to machine learning technique that has been using nowadays due to its efficiency of the results and similarity with the practical facts. In this technique, labeled classes are turned to model and then are trained and tested to check the correctness using accuracy. The Contributions of the paper are explained as follows. We initially discuss the different techniques and then we employ machine learning techniques to network data set and do a comparative analysis on different algorithm on which one is best suited to analyze the network traffic. We collect the features using Wireshark tool and then we convert this data to csv file format then train and test using Python Libraries which help to predict and further the comparative analysis is carried out. We employ Decision Tree (DT), Naïve Bayes (NB), Knearest neighbor (KNN), and Support Vector Machine (SVM) techniques. We find that KNN Technique outperforms for this application.

2. LITERATURE SURVEY

1) Port Based–All the ports are registered with IANA, by hashing the application protocol with the ports registered from IANA, one can easily identify the traffic in the network. For instance, the standardized port numbers assigned for sending and receiving E-mail are 25(SMTP) and 110(POP3), respectively. Now, these port numbers are universal standard for all the networks all over the globe. There are certain drawbacks associated with this technique. The major drawback felt in this type of classification is detection of only well-known port numbers. Another drawback is in cases of unregistered or dynamic port numbers that are not mentioned by IANA. Below is the table that illustrates the currently registered port numbers with IANA.

This technique also inlays certain drawbacks. The drawback associated with this is that it requires a very expensive hardware in a payload for pattern searching. In an encrypted form of traffic this technique is bound to fail. Finally, while working with new applications, this approach requires updating of new signature patterns [2].

3) Machine Learning Techniques - Machine learning has been used to classify various forms of data. In this project, this technique is employed to classify the application protocols. According to this technique, the machine (learning classifier) is trained, by given certain collection of data, in order to achieve maximum success rate, usually a large amount of data is employed for better training. After the training process, certain sample of data class is supplied to the classifier, so as to check how well the machine is trained, by evaluating the output of the machine and comparing them to original output. There are two types of machine learning techniques: Unsupervised and Supervised Machine Learning.

i) Unsupervised Technique: In this type of technique, A raw dataset is provided to the learning classifier, by raw we mean the data without any predefined labels or tags. This method of machine learning is also known as clustering. This technique divided the dataset into set of clusters with each data entry belonging to a

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specific cluster and hence can be used to further predict cluster to which future data entry would correspond to. But we cannot use this technique for network classification as it cannot cluster according to predefined class variables.

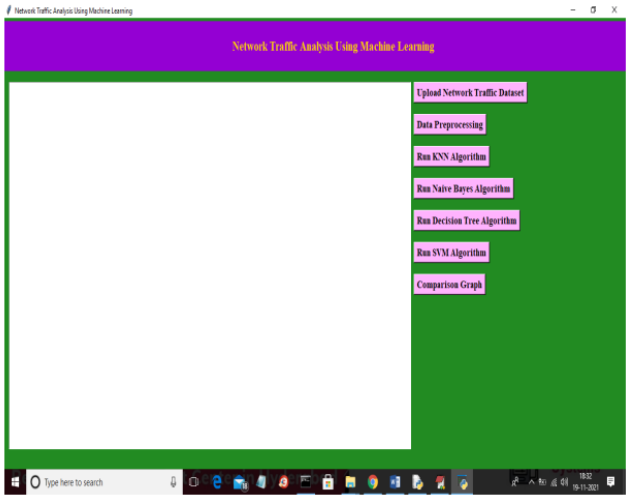
ii) Supervised Technique Yet another classification technique and a useful part of machine learning is Supervised Technique. Presence of a well labeled complete data set is requirement if one wishes to employ any of supervised learning method. The working process of this method is a two steps procedure, first the data sample is trained using the specified labels, and then it is then employed to test in a new data sample [2]. Hence a useful technique is used to classify the network traffic data.

3. METHODOLOGY

ALGORITHM:

The Convolutional Neural Network gained popularity through its use with image data, and is currently the state of the art for detecting what an image is, or what is contained in the image. CNNs even play an integral role in tasks like automatically generating captions for images. The convolutional neural network (CNN) is a type of multi-layer neural network, which extracts features by combining convolution, pooling, and activation layers. The CNN is widely used in the field of pattern recognition. Many researchers have applied the CNN to traffic sign recognition and detection and have achieved good results.

In the detection stage, the traffic signs were classified into two super classes: Circular and triangular traffic signs. In the classification stage, we trained three CNNs for two classification methods. One method trained two CNNs for circular and triangular traffic signs independently. The other method trained one CNN for the overall traffic sign classification. Each of the three CNNs had two convolutional layers, and each of the convolutional layers were followed by a sub sampling layer. They all used a fully connected layer to produce the final classification result. The eight Gabor features of each traffic sign were used as inputs of the three CNNs, with a fixed size of 32×32. The first convolutional layer extracted six features for each input with 8×6 kernels (size 5×5). Additionally, the second convolutional layer extracted 12 features for each input; hence, the second convolutional layer consisted of 6×12 kernels with a size of 5×5. The 12 feature maps from the second layer were used as feature vector inputs to the fully connected layer, to produce the final classification result.



In above screen click on 'upload Network Traffic Dataset' button to upload dataset.

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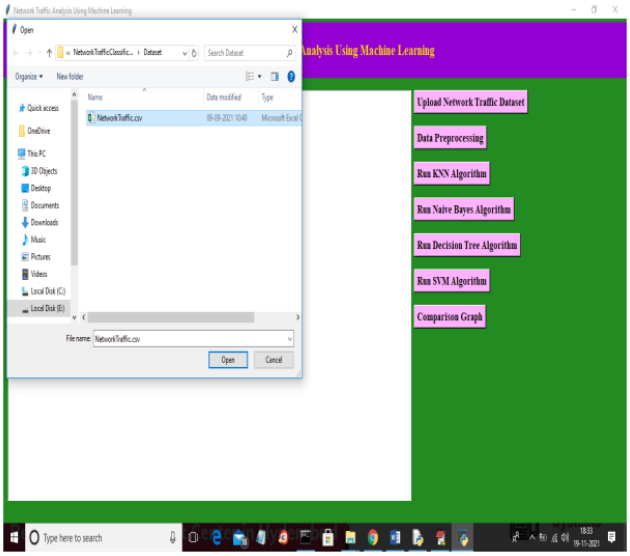
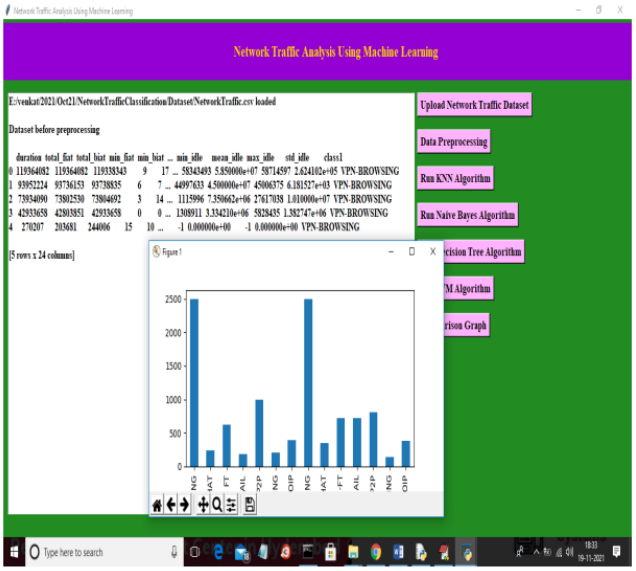
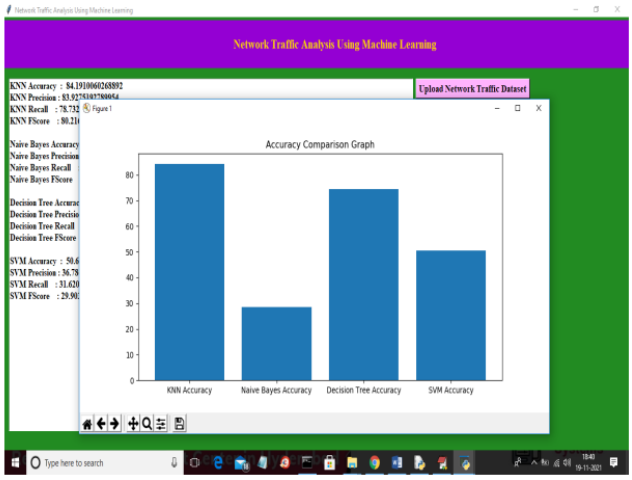


In above screen selecting and uploading 'NetworkTraffic.csv' file and then click on 'Open' button to load dataset and to get below screen.



In above screen we can see dataset loaded and dataset contains lots of non-numeric values so we need to process it and in graph x-axis we can see traffic type and y-axis represents total records in dataset for that traffic. Now close above graph and then click on 'Data Preprocessing' to clean dataset.



In above graph x-axis represents algorithm name and y-axis represents accuracy of those algorithms and in all algorithms KNN shows better result.

CONCLUSION

The Network traffic classification techniques are discussed in this paper to enhance some idea about Machine Learning algorithms for network traffic data. The analysis carried out definitely helps to a new analyst to make the decision about which Machine Learning algorithm is more appropriate for this application. Initially, the network traffic extraction is carried out to evaluate the different Machine Learning algorithm which is trained in later phase. The Machine Learning algorithms are used for managing the performance of network and classification of unknown applications.We then employ four basic Machine Learning algorithms to analyze the protocol. Further, the classifiers using different Machine Learning algorithms are developed to compare the accuracy for this network traffic data. We find that K-nearest

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neighbor (KNN) algorithm outperforms Naïve Bayes algorithm, Decision Tree and Support Vector Techniques in terms of accuracy which is due to the fact that KNN uses better classification criterion than Naïve Bayes and Decision Tree Algorithm. We find that KNN is most robust among the algorithms: NB, DT, and SVM for out training data set. It is also able to maintain highest mean for accuracy.

REFERANCES

[1] Chakraborty, A., J.S. Banerjee, and A. Chattopadhyay. Non-uniform quantized data fusion rule alleviating control channel overhead for cooperative spectrum sensing in cognitive radio networks. in 2017 IEEE 7th International Advance Computing Conference (IACC). 2017. IEEE.

[2] Chakraborty, A., J.S. Banerjee, and A. Chattopadhyay, Non-uniform quantized data fusion rule for data rate saving and reducing control channel overhead for cooperative spectrum sensing in cognitive radio networks. Wireless Personal Communications, 2019. 104(2): p. 837-851.

[3] Rueda, A. A survey of traffic characterization techniques in telecommunication networks. in Proceedings of 1996 Canadian Conference on Electrical and Computer Engineering. 1996. IEEE.

[4] Shahbar, K. and A.N. Zincir-Heywood. How far can we push flow analysis to identify encrypted anonymity network traffic? in NOMS 2018-2018 IEEE/IFIP Network Operations and Management Symposium. 2018. IEEE.

[5] Axelsson, S., Intrusion detection systems: A survey and taxonomy. 2000, Technical report.

[6] Wang, P., Y. Li, and C.K. Reddy, Machine learning for survival analysis: A survey. ACM Computing Surveys (CSUR), 2019. 51(6): p. 110.

[7] Namdev, N., S. Agrawal, and S. Silkari, Recent advancement in machine learning based internet traffic classification. Procedia Computer Science, 2015. 60: p. 784-791.

[8] Cheng, Y., et al., Bridging machine learning and computer network research: a survey. CCF Transactions on Networking, 2019. 1(1- 4): p. 1-15.

[9] Mukkamala, S., G. Janoski, and A. Sung. Intrusion detection: support vector machines and neural networks. in proceedings of the IEEE International Joint Conference on Neural Networks (ANNIE), St. Louis, MO. 2002.

[10] Taylor, V.F., et al., Robust smartphone app identification via encrypted network traffic analysis. IEEE Transactions on Information Forensics and Security, 2017. 13(1): p. 63-78.

A Transformative Impact on Media Markets based on Media and Artificial Intelligence

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Abstract-

While AI and related technologies will indeed have a transformative impact on media markets, automated production of content whether news or entertainment is likely to be a minor part of this story for the foreseeable future. Unlike industries such as manufacturing and transportation, where thousands of jobs consist mainly of repetitive tasks that are well within the capability of current technologies, most of the value in media is in the production of complex content that heavily weights areas like judgment, interpretation, creativity, and communication, where humans continue to dominate algorithms and will do so for many years to come. Instead, the major impact of AI has been and will continue to be on the demand side of media not the production of content, but the process by which this content is matched to consumers. Future improvements in AI have the potential to profoundly alter this process for both good and for ill.

Key words- *Transformative Impact, Media Markets, Media and Artificial Intelligence, Automated Production.*
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INTRODUCTION

On March 17, 2014, a magnitude 4.4 earthquake shook southern California. The first story about the quake on the LA Times' website a brief, factual account posted within minutes was written entirely by an algorithm. Since then, "robot reporters" have produced stories in major news outlets on topics ranging from minor league baseball games to corporate earnings announcements. Some have speculated that future media will consist largely of content produced by artificial intelligence (AI). While AI and related technologies will indeed have a transformative impact on media markets, automated production of content whether news or entertainment is likely to be a minor part of this story for the foreseeable future. Unlike industries such as manufacturing and transportation, where thousands of jobs consist mainly of repetitive tasks that are well within the capability of current technologies, most of the value in media is in the production of complex

content that heavily weights areas like judgment, interpretation, creativity, and communication, where humans continue to dominate algorithms and will do so for many years to come. Instead, the major impact of AI has been and will continue to be on the demand side of media not the production of content, but the process by which this content is matched to consumers. Future improvements in AI have the potential to profoundly alter this process for both good and for ill. The basic economics of media mean demand-side matching plays a uniquely important role. News stories, social media posts, songs, and movies are all prototypical "experience goods" whose quality and fit with a consumer's tastes can only be judged once they have been consumed. Marginal costs are low, and the nature of demand varies greatly across consumers and time. Together, these factors mean that the market produces oceans of content of widely varying quality and appeal that must be sorted and filtered in order to produce social value. Effective matching, whether by traditional mechanisms such as human editing and well-known media brands, or by modern algorithms, is what converts this mass into a comprehensible, entertaining, and informative set of goods. It is a key factor determining the level of trust in media and the extent to which media can be manipulated by governments, advertisers, or other third parties seeking to persuade. It is what has been thoroughly upended by the advent of social media, which puts a decentralized, algorithm-driven process of matching in place of the centralized broadcasting model that has dominated media for centuries. And it is where we need to focus our attention if we are to address the current crisis of media and democracy. There are three main dimensions along which this matching process can fail. First, quite simply, consumers may not be able to find what they want. Despite tremendous progress in search and related technologies, sifting through the mass of content to find the pieces that maximize a consumer's utility remains a formidable problem. Second, what consumers want may not be well aligned with what is best for society. Scholars have long pointed out that individual and social objectives are likely to diverge in media, as consumers do not fully account for the way their own decisions to be more or less informed about various issues spill over and affect others via the political process. Third, actors such as governments and firms may seek to capture media in order to shape the selection of content consumers see for their own ends. AI has the potential to dramatically improve the efficiency with which the market matches content to consumers. However, the potential gains, and also the possible negative consequences, vary greatly across these three dimensions.

AI AND SEARCH

The most obvious gains from AI will come in making it easier for consumers to find the media content that they want. This "search" problem encompasses not only search technologies strictly defined, but also recommendations, reviews, and an array of other technologies that help consumers navigate content. At first glance, search appears to be a prototypical application in which the gains to AI should be large. In general, AI will be effective in domains with (i) a tightly specified decision problem; (ii) measurable, clearly defined objectives; (iii) large volume of data on prior cases. Choosing a piece of content to satisfy a consumer's immediate demand clearly satisfies (i). Clicks, viewing time, and other easily captured metrics easily satisfy (ii). And online interactions produce vast amounts of data sufficient for (iii). The gains to AI in search and recommendation problems have indeed been substantial. The "Netflix Challenge" how to use prior data on individual consumers' movie ratings to predict future ratings was a canonical application of machine learning. Google search, Amazon product recommendations, and the Facebook news feed all rely heavily on AI technologies. Yet in another sense, the gains from AI have been surprisingly small. People have been predicting for decades that the defining feature of digital media will be the personalization of search and matching going beyond simply sorting web pages or movies to show those most relevant to a query, and instead using rich information about a consumer's prior choices and characteristics to select content uniquely suited to

their individual tastes. Though people have been forecasting a revolution in the quality of personalization for as long as the internet has existed, this promise remains largely unrealized. Google search today involves essentially no personalization. The only major exception is the use of location data to define locally relevant results. Two users at the same location entering the same query will see the same results in the overwhelming majority of cases. While personalized recommendations are certainly prominent on sites like Netflix and Amazon, their quality remains by most accounts surprisingly poor. If I log in to Netflix today, four out of five of my "personalized recommendations" are for additional episodes of television series I have already watched. Amazon's "Recommendations for You" page offers mostly products I have already purchased, or products very similar to those I have already purchased suggesting for example, that since I recently bought an electric toothbrush, I might like to buy another one. Even on Facebook, where personalization of content and advertising are at the core of the business, evidence suggests that much of what drives variation in users' newsfeeds is the set of items their friends share (combined with non-personalized predictions of the overall popularity of content) rather than finely tailored individual recommendations. What explains this personalization paradox? One possibility is that the predictions of a revolution in personalization have just been premature, and that AI technology is now reaching the point where the promise will finally be realized. There is certainly no doubt that progress will continue, and there will likely be domains where frontier technologies do produce large gains. There may be a more fundamental answer to the paradox, however. Consider three different tasks that a search algorithm might perform. The first is providing an interface through which a consumer can communicate what they are looking for at a particular moment e.g., parsing the text of a Google search like "Indonesia tsunami news" to determine its meaning. The second is ranking content in terms of its average quality or relevance e.g., determining that a tsunami story on WSJ or CNN is on average preferred to a similar sounding story on an obscure political blog. The third is personalization e.g., using consumer characteristics or past behavior to determine that one consumer might prefer the WSJ story while another might prefer the CNN story. The relative return to improving each of these tasks depends on the extent to which tastes are correlated between consumers and within consumers over time. Personalization will be most important in a world where the key dimension is stable individual differences in preferences some consumers always like to read highbrow stories about tsunamis while others always like to read lowbrow stories, say. The other tasks become more important to the extent that what a given consumer is wants at one moment can be quite different from what she wants at another, and that for a given need consumers agree to a significant degree about what is most relevant. A possible explanation for the personalization paradox, then, is that we have tended to over-estimate the importance of stable individual differences relative to the other kinds of variation. Figure 1 shows one example consistent with this hypothesis based on web browsing data from 2008. Each point in the plot is an online news or politics site. The x axis shows the average utility liberals get from the site and the y axis shows the average utility conservatives get from the site, where both are inferred from each group's likelihood of visiting the sites. A world where stable individual differences were key would be one where this plot sloped downward some sites give high utility to conservatives and low utility to liberals while others

do the reverse. In that world, knowing the searcher's ideology and customizing content to it would be critical. In fact, the plot is clearly upward sloping with a high positive correlation. It is true that conservatives like foxnews.com relatively more and that liberals like nytimes.com relatively more, but this kind of variation is swamped by the fact that everyone likes both of these sites more than smaller sites and blogs. There is no question that the quality of search and recommendation systems will continue to improve dramatically with advances in AI. It may well be, however, that these gains continue to be more about improved communication with users and overall ranking of content than about personalization.

AI AND BIAS

Many of the deepest problems in media today stem not from an inability to give consumers what they want, but from the fact that what they appear to want is not aligned with what is good for society. Some may demand celebrity news and puppy videos rather than information that would make them more informed citizens. Others may prefer misleading partisan content or outright misinformation rather than more balanced and accurate political news. A substantial risk in an AI driven future is that algorithms become ever more expert at catering to
these tastes, with disastrous consequences for society. Can AI also be part of the solution? It certainly has a role to play. Facebook and others have devoted significant effort to training algorithms to identify misinformation. Google can in principle tune its algorithms to weight social objectives as well as the likelihood of clicks, for example by showing accurate information about the Holocaust rather than Holocaust denial sites in response to the query "did the Holocaust happen?". If we return to the criteria for what makes problems amenable to AI solutions, however, it is
clear that we should expect AI to be far less effective in addressing bias than in improving search. Social objectives such as promoting truth and healthy democracy are much harder to define precisely than giving consumers what they want, and there are few cases in which they are easily quantifiable. Training data for search is generated automatically by consumer clicks; training data for identifying misinformation, in contrast, must typically be coded by human fact checkers. For other forms of bias, there are essentially no training cases because we lack hard measures of the broader social impact of most content. Consistent with this prediction, most efforts to fight bias and misinformation to date have relied primarily on human judgment. While Facebook's efforts to fight misinformation certainly involve AI, most of the effective strategies have been things like downranking sites that consumers report trusting less, adding "article context" information with additional detail about sources, and filtering articles based on fact checking. These all involve far more human judgment than AI. Similarly, Google's adjustments to cases like Holocaust denial have relied to a significant degree on changing instructions to human raters rather than changing the objectives of AI algorithms. We can hope that future developments in AI will make it more effective in aligning media content with social good. For the near future, however, most progress is likely to continue to come from human intelligence as curator, editor, and counterweight to the forces pulling more and more strongly toward satisfying short-run consumer demand.

AI ANDCAPTURE

Probably the oldest, and possibly the most serious, concern is that media may be captured by third parties that shape or filter content to serve their own objectives. A leading case today is the massive censorship apparatus of the Chinese government. Other autocratic governments engage in similar activity on a smaller scale, and even democratic governments frequently intervene to try to suppress content they find objectionable. Governments not only try to affect what their own citizens see but what is seen abroad, as in the case of Russian interference in US
and European elections. The advertising that fuels most digital markets is itself a form of third-party intervention. How is AI likely to change the risk of media capture? Here, again, AI has the potential to both dramatically worsen the dangers and to be a key part of the solution. On one hand, the Chinese government can use AI to more effectively screen objectionable content, monitor citizens to identify dissidents and impending protests, and target propaganda messages to maximize their effectiveness. Russian intelligence operatives can use AI to optimize their foreign influence campaigns, testing large volumes of content to determine what
works best. Commercial advertisers can similarly use these tools to optimize and target content. On the other hand, AI may also provide a robust defense against such manipulation. Consumers in autocratic countries can use AI to detect propaganda images and other content that has

been manipulated from its original source. Better search technologies from international sources can help consumers evade domestic controls. Facebook and other social media companies can use AI to identify foreign interference in elections. Again, the key question is to what extent the relevant objectives can be defined and measured at large scale. Identifying social media posts that mention sensitive topics such as Tibet or that comment critically on the government should be right in the sweet spot in this respect, given the ability of modern natural language processing tools to disambiguate meaning. Online surveillance to identify dissidents or impending protests is also well suited to AI, though in these cases the number of past examples that can be used for training is much smaller in scale. Optimizing for actual persuasive impact is a much harder task. While it is easy to observe the reach of propaganda or advertising, determining its effectiveness is much harder, particularly when the goal is to affect a long-run outcome like support for a regime rather than a short-run outcome like internet purchases. Some of the most relevant research on this problem to date comes from work by Bei Qin, David Stromberg, and Yanhui Wu on the content of Chinese social media. They show, on one hand, that Chinese social media is actually full of government criticism and discussion of sensitive topics, suggesting either that the regime prefers not to suppress these topics or that their technology does not yet allow them to do so comprehensively. (Which explanation is correct has important implications for the way we should expect censorship to evolve with better AI). At the same time, these authors show that machine learning applied to social media provides a potentially powerful surveillance tool, with even simple algorithms able to predict the occurrence of future protests or unrest with high fidelity.

AI APPLICATION IN THE ADVERTISING INDUSTRY

The impact of AI on the advertising process is an increasing challenge that takes the form of a systematic reorganization. A new set of process steps consumer insight discovery, ad creation, media planning, and buying, and ad impact evaluation has emerged, resulting in the emergence of a new class of advertising activities, including large-scale personalized advertising production based on consumer profiling, omnichannel precision media planning, and buying, and proactive strategy-based algorithms that evaluate and optimize advertising impact.

(i) AD Platform- Programmatic advertising exchanges and ad tech platforms manage real-time buying and selling using artificial intelligence and machine learning. This includes almost every ad exchange, third-party network, and advertising solution available on Facebook, Instagram, and Snapchat. These exchanges, services, and platforms are unlikely to explain to marketers how their artificial intelligence works in the near future. That, however, is precisely the point: Even behind the scenes, artificial intelligence dictates how money is spent, who sees
commercials, and the overall efficacy of campaigns. That implies that if a business uses paid to advertise, it must be conversant with the vocabulary of artificial intelligence (this resource is a fantastic place to start) and ask the right questions about how each ad platform's AI may affect the spending.

(ii) Optimize Budget and Targeting- Today, artificial intelligence solutions show that they can optimize advertising expenditure and target automatically. AI can analyse the ad spend and targeting
data, then determine which actions (spending adjustments, targeting modifications) will improve performance. Across a large number of complex initiatives, these actionable insights are produced and executed at scale. We discovered that Red Balloon, a travel company, used an artificial intelligence (AI) application called Albert to optimize and manage their digital advertising budget and plan automatically. The outcomes were mind-blowing. Albert discovered methods for increasing return on investment and outperforming human agencies by optimizing expenditure and targeting. Additionally, through the insights gained from adequate amounts of expenditure data, the tool discovered new consumers for Red Balloon's products that the firm was unaware existed.

(iii) Ad Creation and Management- AI determines how the advertisements work and may even assist

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people in significantly increasing performance. However, it is also utilized nowadays to simplify the process of creating advertising campaigns significantly. Platforms with advertising components, most notably Facebook, offer AI that enables people to generate ad text and variants far quicker than people could manually, utilizing previously submitted material. However, some commercially accessible technologies go much further. The tool with AI capabilities Advertisements on Facebook and Instagram are created by Phrasee and are optimized for conversion based on what has worked in the past for the business. As it learns from each new ad, the technology becomes better and better over time.(This is the same kind of AI technology that drives use cases for content generation in content marketing).

CONCLUSION

There is no question that AI will have profound impacts on media markets. While automation of production may play some role, the unique properties of media goods mean the more important effects are likely to occur on the demand side. Here, there is great potential for social good, as AI can make it easier for consumers to navigate the bewildering mass of online content through search and personalized recommendations, and to identify cases where third parties are attempting to manipulate them. There is also cause for concern, as AI may tilt content more heavily toward consumer demand in domains where this is at odds with social good, and AI tools may be used to more effectively persuade and deceive.

REFERENCES

[1]. Matthew Gentzkow and Jesse M. Shapiro, 2011, "Ideological segregation online and offline," Quarterly Journal of Economics, 126(4), Model Appendix.
[2]. Weber Shandwick Homepage, report-Oct12-FINAL.pdf, last accessed 2019/12/24.
[3] Thiraviyam T., Artificial Intelligence Marketing, In: Proceedings of International Journal of Recent Research Aspects, pp. 449–52, April (2018)
[4] HBR Homepage, https://hbr.org/resources/pdfs/comm/people.ai/acceleratingsales.pdf last accessed 2020/02/12
[5] Mckinsey Homepage, https://www.mckinsey.com/featured-insights/artificial-intelligence/ai-adoption-advances-but-foundational-barriers-remain, last accessed 2020/02/07
[6] InsiderPro Homepage, https://www.idginsiderpro.com/article/3302739/how-ai-is-reshaping-marketing.html Last Accessed 2020/02/19.
[7] Smart Insights Homepage, https://www.smartinsights.com/managing-digital-marketing/managing-marketing-technology/how-ai-is-changing-the-role-of-the-marketer-in-2018/, Last Accessed 2019/12/20.
[8] M. Avinaash, Dr. Jayam R., Artificial Intelligence - The Marketing Game Changer. In: proceedings of International Journal of Pure and Applied Mathematics, pp. 1881-1890, 119(17), IJPAM (2018)
[9] MapR Homepage, https://mapr.com/blog/demystifying-ai-ml-dl/. Last Accessed 2019/12/20.
[10] Davenport T., Guha A., Grewal D., Bressgott T. (2020), How artificial intelligence will change the future of marketing, Journal of the Academy of Marketing Science, pp. 24-42, 48(1).
[11]. Soni N., Sharma E. K., Singh N., Kapoor A. (2019) Impact of Artificial Intelligence on Businesses: from Research, Innovation, Market Deployment to Future Shifts in Business Models, Journal of Business Research
[12] Shahid M. Z., Li G. (2019), Impact of Artificial Intelligence in Marketing: A Perspective of Marketing Professionals of Pakistan, Global Journal of Management and Business Research: E Marketing, pp. 26-33, 19(2).
[13] Overgoor G., Chica M., Rand W., Weishampel A. (2019), Letting the Computers Take over: Using Ai to Solve Marketing Problems, California Management Review, pp. 156-185, 61(4)
[14] Ramya N., Dr. Ali M. SA (2019), Factors Affecting Consumer Buying Behaviour, International Journal of Advanced Research, pp. 563-568, 7(1).
[15] Raunaque N., Zeeshan Md., Imam A. Md. (2016), Consumer Perception Towards Online Marketing in India, International Journal of

*e*ISSN1303-5150

Advanced Engineering, management and science, pp.1236-1240,2(8).
[16] DR Quasim Md. T., Chattopadhyay R. (2015), Artificial intelligence as a business forecasting and error handling tool, COMPUSOFT an International Journal of Advanced Computer Technology, pp. 1534-1537, 4(2).
[17] Annor- Antwi A., Al-Dherasi A. A. M. (2019), Application of Artificial Intelligence in Forecasting: A Systematic Review, SSRN Electronic Journal
[18] Malhotra N.K., Peterson M. (2001), Marketing research in the new millennium: Emerging issues and trends, Marketing Intelligence and Planning, pp. 216-232, 19(4).
[19] Ajanthan D. (2017), The Impact of a Social Media Marketing on Customer Based Brand Equity- A Special Reference to Travel & Tourism Industry in Sri Lanka, TRANS Asian Journal of Marketing Management Research, pp. 36-46, 6(11).
[20] Morgan N. A., Whitler K.A., Feng H., Chari S. (2019), Research in marketing strategy, Journal of the Academy of Marketing Science, pp. 4-29, 47(1).
[21] Shen A. (2014), Recommendations as personalized marketing: insights from customer experiences. Journal of Services Marketing, pp. 414-427, 28(5).

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PACKET INSPECTION TO IDENTIFY NETWORK LAYER ATTACKS USING MACHINE LEARNING

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ABSTRACT:

Intrusion detection can identify unknown attacks from network traffics and has been an effective means of network security. Nowadays, existing methods for network anomaly detection are usually based on traditional machine learning models, such as KNN, SVM, etc. Although these methods can obtain some outstanding features, they get a relatively low accuracy and rely heavily on manual design of traffic features, which has been obsolete in the age of big data. To solve the problems of low accuracy and feature engineering in intrusion detection, a traffic anomaly detection model BAT is proposed. The BAT model combines BLSTM (Bidirectional Long Short-term memory) and attention mechanism. Attention mechanism is used to screen the network flow vector composed of packet vectors generated by the BLSTM model, which can obtain the key features for network traffic classification. In addition, we adopt multiple convolutional layers to capture the local features of traffic data. As multiple convolutional layers are used to process data samples, we refer BAT model as BAT-MC. The softmax classifier is used for network traffic classification. The proposed end-to-end model does not use any feature engineering skills and can automatically learn the key features of the hierarchy. It can well describe the network traffic behavior and improve the ability of anomaly detection effectively. We test our model on a public benchmark dataset, and the experimental results demonstrate our model has better performance than other comparison methods.

Key words: BAT, MAC, CNN, DL, ML.

I INTRODUCTION

Intrusion detection plays an important part in ensuring network information security. Machine learning methods have been widely used in intrusion detection to identify malicious traffic. However, these methods belong to shallow learning and often emphasize feature engineering and selection. They have difficulty in features selection and cannot effectively solve the massive intrusion data classification problem, which leads to low recognition accuracy and high false alarm rate. In recent years, intrusion detection methods based on deep learning have been proposed successively.

1.2 PROBLEM DEFINITION

The existing methods for network anomaly detection are usually based on traditional machine learning models, such as KNN, SVM, etc. Although these methods can

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obtain some outstanding features, they get a relatively low accuracy and rely heavily on manual design of traffic features, which has been obsolete in the age of big data.

1.3 OBJECTIVE OF PROJECT

we adopt multiple convolutional layers to capture the local features of traffic data. As multiple convolutional layers are used to process data samples, we refer BAT model as BAT-MC. The softmax classifier is used for network traffic classification.

2.LITERATURE SURVEY

2.1 A Survey: Intrusion Detection Techniques for Internet of Things

AUTHORS:Sarika Choudhary and Nishtha Kesswani

The latest buzzword in internet technology nowadaysisthe Internet of Things. The Internet of Things (IoT) is an ever-growing network which will transform real-world objects into smart or intelligent virtual objects. IoT is a heterogeneous network in which devices with different protocols can connect with each other in order to exchange information. These days, human life depends upon the smart things and their activities. Therefore, implementing protected communications in the IoT network is a challenge. Since the IoT network is secured with authentication and encryption, but not secured against cyber-attacks, an Intrusion Detection System is needed. This research article focuses on IoT introduction, architecture, technologies, attacks and IDS. The main objective of this article is to provide a general idea of the Internet of Things, various intrusion detection techniques, and security attacks associated with IoT.

2.2 Network intrusion detection

AUTHORS:B. Mukherjee, L.T. Heberlein and K.N. Levitt

Intrusion detection is a new, retrofit approach for providing a sense of security in existing computers and data networks, while allowing them to operate in their current "open" mode. The goal of intrusion detection is to identify unauthorized use, misuse, and abuse of computer systems by both system insiders and external penetrators. The intrusion detection problem is becoming a challenging task due to the proliferation of heterogeneous computer networks since the increased connectivity of computer systems gives greater access to outsiders and makes it easier for intruders to avoid identification. Intrusion detection systems (IDSs) are based on the beliefs that an intruder's behavior will be noticeably different from that of a legitimate user and that many unauthorized actions are detectable. Typically, IDSs employ statistical anomaly and rulebased misuse models in order to detect intrusions. A number of prototype IDSs have been developed at several institutions, and some of them have also been deployed on an experimental basis in operational systems. In the present paper, several host-based and network-based IDSs are surveyed, and the characteristics of the corresponding systems are identified. The host-based systems employ the host operating system's audit trails as the main source of input to detect intrusive activity, while most of the network-based IDSs build their detection mechanism on monitored network traffic, and some employ host audit trails as well. An outline

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of a statistical anomaly detection algorithm employed in a typical IDS is also included.

2.3 survey on sdn based network intrusion detection system using machine learning approaches

AUTHORS: N. Sultana, N. Chilamkurti, W. Peng, and R. Alhadad

Software Defined Networking Technology (SDN) provides a prospect to effectively detect and monitor network securityproblems ascribing to the emergence of the programmable features. Recently, Machine Learning (ML) approaches have beenimplemented in the SDN-based Network Intrusion Detection Systems (NIDS) to protect computer networks and to overcomenetwork security issues. A stream of advanced machine learning approaches – the deep learning technology (DL) commences toemerge in the SDN context. In this survey, we reviewed various recent works on machine learning (ML) methods that leverageSDN to implement NIDS. More specifically, we evaluated the techniques of deep learning in developing SDN-based NIDS. Inthe meantime, in this survey, we covered tools that can be used to develop NIDS models in SDN environment. This survey isconcluded with a discussion of ongoing challenges in implementing NIDS using ML/DL and future works.

Existing system:

Most algorithms have been considered for use in the past. In [16], the authors make a summary of pattern matching algorithm in Intrusion Detection System: KMP algorithm, BM algorithm, BMH algorithm, BMHS algorithm, AC algorithm and AC-BM algorithm. Experiments show that the improved algorithm can accelerate the matching speed and has a good time performance. In [17], Naive approach, Knuth-MorrisPratt algorithm and RabinKarp Algorithm are compared in order to check which of them is most efficient in pattern/intrusion detection. Pcap files have been used as datasets in order to determine the efficiency of the algorithm by taking into consideration their running times respectively.

DISADVANTAGES OF EXISTING SYSTEM:

1. we are also facing various security threats. Network viruses, eavesdropping and malicious attacks are on the rise, causing network security to become the focus of attention of the society and government departments.
2. to identify various malicious network traffics, especially unexpected malicious network traffics, is a key problem that cannot be avoided.

PROPOSED SYSTEM:

The accuracy of the BAT-MC network can reach 84.25%, which is about 4.12% and 2.96% higher than the existing CNN and RNN model, respectively. The following are some of the key contributions and findings of our work:

1) We propose an end-to-end deep learning model BAT-MC that is composed of BLSTM and attention mechanism. BAT-MC can well solve the problem of intrusion detection and provide a new research method for intrusion detection.

2) We introduce the attention mechanism into the BLSTM model to highlight the key input. Attention mechanism conducts feature learning on sequential data composed of data

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package vectors. The obtained feature information is reasonable and accurate.

3) We compare the performance of BAT-MC with traditional deep learning methods, the BAT-MC model can extract information from each packet. By making full use of the structure information of network traffic, the BAT-MC model can capture features more comprehensively.

4) We evaluate our proposed network with a real NSL-KDD dataset. The experimental results show that the performance of BAT-MC is better than the traditional methods.

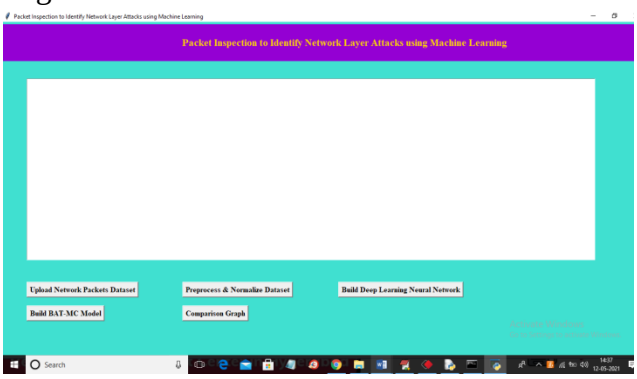
ADVANTAGES OF PROPOSED SYSTEM:

1.The BAT-MC model consists of five components, including the input layer, multiple convolutional Layers, BSLTM layer, attention layer and output layer, from bottom to top.

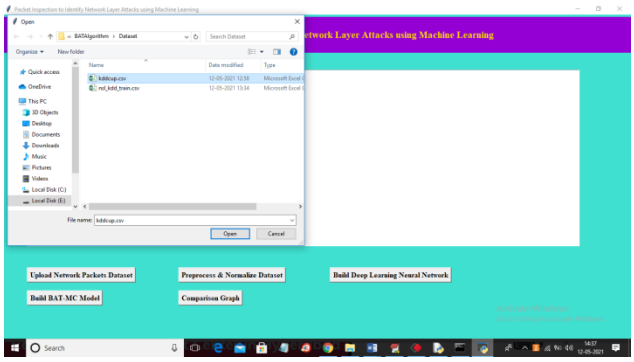
2. At the input layer, BAT-MC model converts each traffic byte into a one-hot data format. Each traffic byte is encoded as an n-dimensional vector. After traffic byte is converted into a numerical form, we perform normalization operations

METHODOLOGY

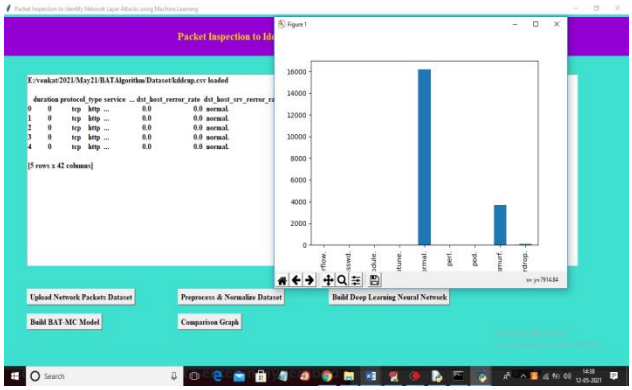
To run project double click on 'run.bat' file to get below screen



In above screen click on 'Upload Network Packets Dataset' button to upload dataset and to get below screen



In above screen selecting and uploading 'kddcup.csv' file and then click on 'Open' button to load dataset and to get below screen



In above screen in text area we can see dataset loaded and we can see data contains alpha numeric data and ML algorithms accept only numeric values so we need to preprocess and normalize them and in graph we can see different attack names in x-axis and total attack types on y-axis and now close above graph and then click on 'Preprocess & Normalize Dataset' button to normalize data

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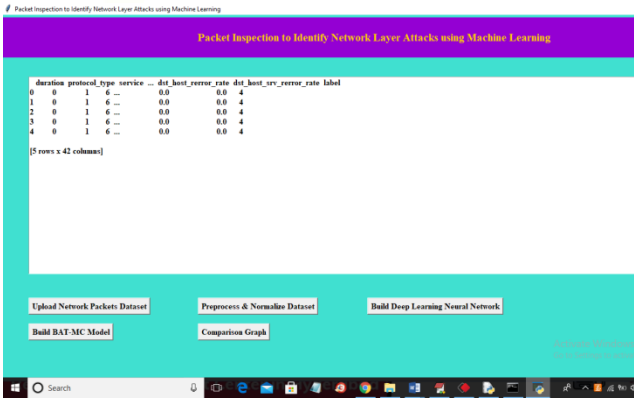
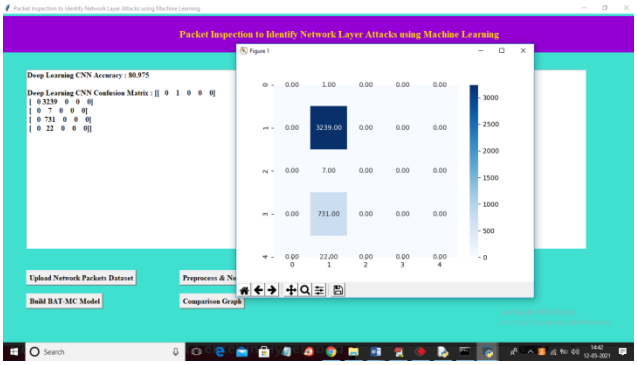
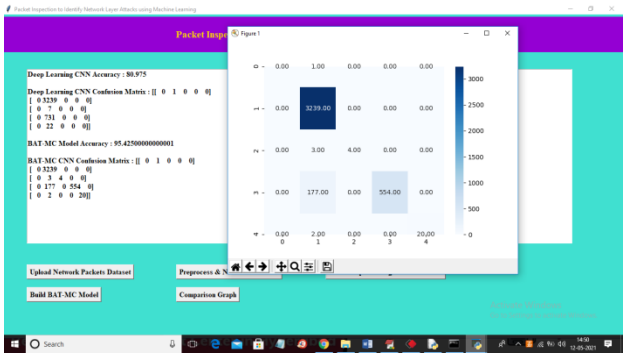


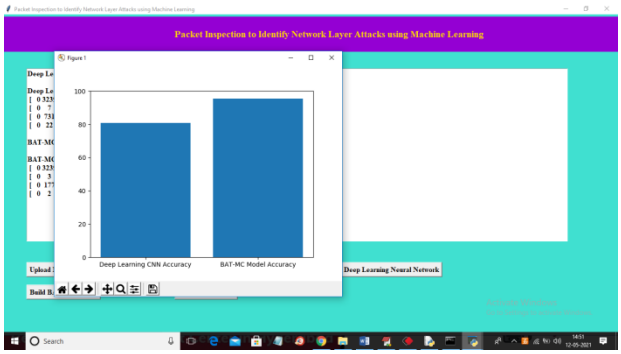
In above screen we can see dataset converted to numeric values by assigning ID's to each unique non-numeric data and now dataset is ready and now click on 'Build Dee Learning Neural Network' button to train CNN above dataset and then calculate prediction accuracy



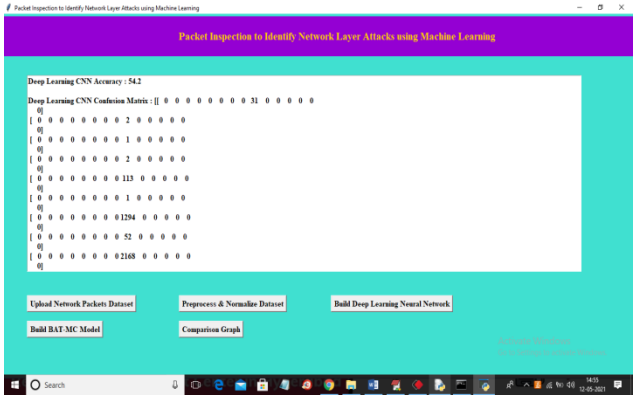
In above screen we can see CNN algorithm got 80% accuracy and in confusion matrix we can see total 5 different attacks are found and in confusion matrix we can see which attack predicted how many times. For example attack 2 predicted 3239 times in entire test data. Now close above graph and then click on 'Build BAT-MC Model' to train above dataset with BLSTM algorithm and then calculate prediction accuracy on test data.



In above screen BAT-MC model generated and its prediction accuracy is 95 and now close above graph and then click on 'Comparison Graph' button to get below graph



In above graph x-axis represents algorithm name and y-axis represents accuracy and in both algorithm BAT-MC model is giving better accuracy. Similarly you can upload other dataset and can build CNN and BAT-MC model. In below screen you can see NSL dataset accuracy



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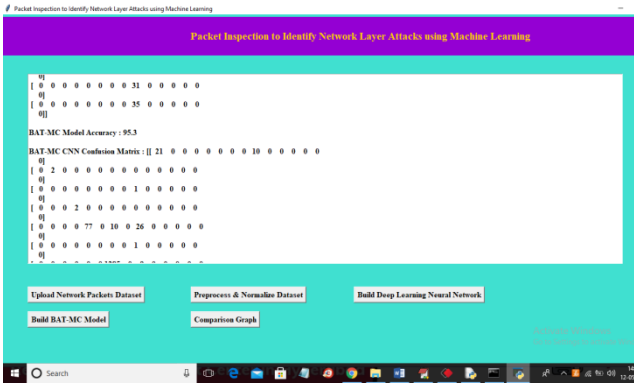
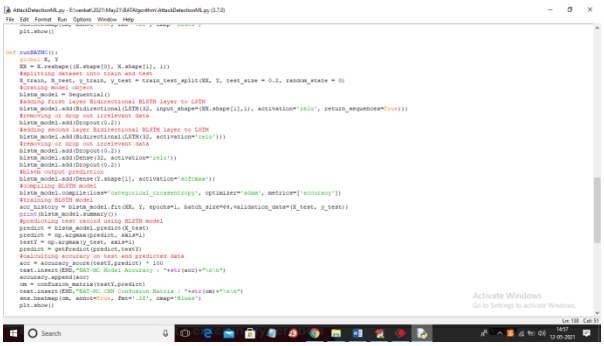
In above screen CNN got 54% accuracy and then scroll down above text area to get BAT-MC accuracy



In above screen BAT-MC got 95% accuracy, Below code screen showing how we are creating BLSTM model to build attack detection model



In above screen read red colour comments to understand development of BAT-MC model

CONCLUSION

The current deep learning methods in the network traffic classification research don't make full use of the network traffic structured information. Drawing on the application methods of deep learning in the field of natural language processing, we propose a novel model BAT-MC via the two phase's learning of BLSTM and attention on the time series features for intrusion detection using NSL-KDD dataset. BLSTM layer which connects the forward LSTM and the backward LSTM is used to extract features on the the traffic bytes of each packet. Each data packet can produce a packet vector. These packet vectors are arranged to form a network flow vector. Attention layer is used to perform feature learning on the network flow vector composed of packet vectors. The above feature learning process is automatically completed by deep neural network without any feature engineering technology.This model effectively avoids the problem of manual design features. Performance of the BAT-MC method is tested by KDDTest+ and KDDTest-21 dataset. Experimental results on the NSL-KDD dataset indicate that the BAT-MC model achieves pretty high accuracy. By comparing with some standard classifier, these comparisons show that BAT-MC models results are very promising when compared to other current deep learning-based methods. Hence, we believe that the proposed method is a powerful tool for the intrusion detection problem.

REFERANCES

1. B. B. Zarpelo, R. S Miani, C. T. Kawakani, and S. C. de Alvarenga, ''A survey of intrusion detection in Internet of Things,'' J. Netw. Comput. Appl., vol. 84, pp. 25–37, Apr. 2017.

2. B. Mukherjee, L. T. Heberlein, and K. N. Levitt, ''Network intrusion detection,'' IEEE Netw., vol. 8, no. 3, pp. 26–41, May 1994.

3. S. Kishorwagh, V. K. Pachghare, and S. R. Kolhe, ''Survey on intrusion detection system using machine learning techniques,'' Int. J. Control Automat., vol. 78, no. 16, pp. 30–37, Sep. 2013.

4. N. Sultana, N. Chilamkurti, W. Peng, and R. Alhadad, ''Survey on SDN based network intrusion detection system using machine

learning approaches,'' Peer-to-Peer Netw. Appl., vol. 12, no. 2, pp. 493–501, Mar. 2019.

5. M. Panda, A. Abraham, S. Das, and M. R. Patra, ''Network intrusion detection system: A machine learning approach,'' Intell. Decis. Technol., vol. 5, no. 4, pp. 347–356, 2011.

6 W. Li, P. Yi, Y. Wu, L. Pan, and J. Li, ''A new intrusion detection system based on KNN classification algorithm in wireless sensor network,'' J. Electr. Comput. Eng., vol. 2014, pp. 1–8, Jun. 2014.

7.S. Garg and S. Batra, ''A novel ensembled technique for anomaly detection,'' Int. J. Commun. Syst., vol. 30, no. 11, p. e3248, Jul. 2017.

8. F. Kuang, W. Xu, and S. Zhang, ''A novel hybrid KPCA and SVM with GA model for intrusion detection,'' Appl. Soft Comput.., vol. 18, pp. 178–184, May 2014.

9. W. Wang, M. Zhu, X. Zeng, X. Ye, and Y. Sheng, ''Malware traffic classification using convolutional neural network for representation learning,'' in Proc. Int. Conf. Inf. Netw. (ICOIN), 2017, pp. 712–717.

10. P. Torres, C. Catania, S. Garcia, and C. G. Garino, ''An analysis of Recurrent Neural Networks for Botnet detection behavior,'' in Proc. IEEE Biennial Congr. Argentina (ARGENCON), Jun. 2016, pp. 1–6.

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Research Article

Predicting Carbon Residual in Biomass Wastes Using Soft Computing Techniques

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In recent decades, the development of complex materials developed a class of biomass waste-derived porous carbons (BWDPCs), which are used for carbon capture and sustainable waste management. It is difficult in understanding the adsorption mechanism of CO_2 in the air as it has a wide range of properties associated with its diverse textures, functional group existence, pressure, and temperature of varying range. These properties influence diversely the adsorption mechanism of CO_2 and pose serious challenges in the process. To resolve this multiobjective formulation, we use a machine learning classifier that maps systematically the CO_2 adsorption as a function of compositional and textural properties and adsorption parameters. The machine learning classifier helps in the classification of various porous carbon materials during the time of training and testing. The results of the simulation show that the proposed method is more efficient in classifying the porous nature of the CO_2 adsorption materials than other methods.

1. Introduction

To reduce CO_2 emissions, carbon capture and storage (CCS) has been widely accepted [1–4]. As the concentration of carbon dioxide (CO_2) in the atmosphere continues to rise [5], CCS has been regarded as an essential technique. Due to the expense of CO_2 capture [6], more than half of the entire CCS cost is still accounted for by CCS systems. Aside from precombustion and postcombustion, oxy-fuel combustion is the third most cost-effective method of CO_2 capture from industrial emission point sources [7, 8].

This technique, however, has a major barrier due to the low CO_2 concentration in postcombustion flue gases. Regenerative amine solution techniques for postcombustion CO_2 capture

are expensive and plagued by corrosion, solvent loss due to degradation, and environmental toxicity [9]. Researchers are trying to produce cost-effective membranes with high CO_2 permeability for extracting CO_2 from flue gas, but this is still a long way off. In the second generation of carbon capture, solid porous carbon-based CO_2 adsorption is usually considered the most promising method [1, 8, 10].

In addition, it is inexpensive, has minimal energy consumption, and is stable in the cyclic mode. Biomass waste has a number of advantages for making porous CO_2 adsorbents, including sustainability, cost-effectiveness, and abundance [2, 11]. The environmental contamination produced by improper biomass waste management can be reduced with the use of BWDPCs for CO_2 collection, as can climate change mitigation through decarbonization and negative emission technologies [9].

More and more research has been done on BWDPC CO_2 adsorption isotherms at various temperatures in order to decipher and optimise CO_2 adsorption process thermodynamic features [12]. Solid carbon adsorbents are vulnerable to adsorption settings with limited CO2 selectivity because CO_2 adsorption is predominantly dominated by physisorption [10].

Carbonization and activation, followed by heteroatom doping, have a substantial role in increasing CO_2 adsorption capacity and CO_2 selectivity. Carbonization and activation are the two main processes in the production of porous carbon from biomass waste. Carbonization has been a major focus of thermochemical techniques [11].

Chemical and physical activations have received a lot of attention [13, 14]. The fundamental active sites of porous carbons can also be increased by heteroatom doping treatments [15–18]. Acid–base interactions improve CO_2 absorption and selectivity over other gases. Some hazardous or greenhouse gases are released during thermochemical reactions.

Aside from carbon dioxide, the handling of nitrogen oxides emitted must be carefully studied because NOx is both harmful and one of the most common greenhouse gases [18]. In the last decade, BWDPCs under varied carbonization/activation settings and diverse adsorption parameters have largely been treated in similar ways [1, 14], determining whether or not BWDPCs can be effectively employed to absorb CO_2. It is currently uncertain how to optimise the synthesis process by combining carbonization and activation with a realistic guideline.

Furthermore, the textural properties and functional groups of porous carbons are widely regarded as the most important factors influencing CO_2 capture performance [1, 11, 16, 19, 20]. However, it is still unclear how to prioritise these three qualities; a prioritising technique would be advantageous for guiding the synthesis of porous carbons from biomass waste.

Waste-to-energy, biochar for metal and organic compound sorption [21, 22], municipal solid waste treatment [23, 24], and micropollutant oxidation [25, 26] have all recently received a lot of attention due to the potential for machine learning.

Tree-based ML models are a subclass of supervised ML methods that leverage recursive binary splitting of data in a manner that minimises the residual sum of squares [19].

Random forest, decision trees, light and gradient boosting decision trees, and extreme gradient boost are some of the most popular models. With their capacity to cope with tiny datasets, resistance to overfitting, and ability to overcome noisy features, the last three boosting tree-based models have witnessed a spike in popularity in scientific research [27].

Boosting trees have advantages over traditional RF [28], such as global predictions, nonbiased feature weighting, and efficient processing of unevenly distributed datasets. It has also been found that these boosting tree techniques are more efficient in tuning hyperparameters than the more commonly used SVM algorithms when working with relatively small datasets.

The SVM classifier used in this study maps CO_2 adsorption as a function of compositional and textural features, as well as adsorption parameters, to resolve this multiobjective formulation. During training and testing, the machine learning classifier assists in the classification of diverse porous carbon materials. The simulation results suggest that the proposed method is more effective than existing ways of categorising CO_2 adsorption material porous nature.

The major contributions of the work involve the following:

(i) First, we need to collect the information from the database BWDPCs for CO_2 capture was carried out using various keywords (such as biomass waste, porous carbon, biochar, CO_2 adsorption, and capture). Further, it will lead to preprocessing where we eliminate the duplication, similar data, null set, etc.; the rest of the other data will be forwarded to the next stage

(ii) The proposed method FCN extracts and selects the contents from an input image by constructing an accurate data split

(iii) The simulation is conducted to test the efficacy of the model that integrates the contextual information for optimal segmentation of optical cup and disc

2. Data Collection

With the use of major databases, a comprehensive literature analysis of BWDPCs for CO_2 capture was carried out using various keywords (such as biomass waste, porous carbon, biochar, CO_2 adsorption, and capture). 632 data points were gathered from 76 peer-reviewed papers published in the last decade. Biomass waste-derived porous carbons (BWDPCs) are a class of complex materials that are widely used in sustainable waste management and carbon capture. BWDPCs have been extensively used to synthesise CO_2 adsorbents, and the most important requirements for their development were good adsorption and selectivity, steady working capacity, cost-effectiveness, recycling, facile regeneration, and quick absorption–desorption dynamics. This is worth emphasising.

As a result of this, we focused largely on the CO_2 adsorption capacity of BWDPCs at various temperatures and pressures, as well as the textural and compositional features of BWDPCs.

(1) A lack of data on the working capacity, kinetic characteristics, and regeneration of adsorbents was found in most of the articles evaluated, resulting in the inability to create ML models for all of the aforementioned important attributes

(2) Due to a lack of environmental effects and technoeconomic evaluation, performance standards for the other categories were lacking

As a result, when gathering data, the following hypotheses and tactics were employed:

(i) There was no initial judgement or bias on the validity of the data that was initially accepted

(ii) The vast majority of the data was gleaned from published study publications. It was essential to extract the relevant data from the figures using the WebPlotDigitizer software for those data points that were not explicitly listed in a table. An extensive screening process ensured that all data was unique and free of duplications or duplicated submissions

(iii) For the purposes of this study, the input features were divided into three general categories: (1) textural properties; (2) BWDPC elemental compositions; and (3) adsorption parameters, such as CO_2 adsorption temperature and pressure

(iv) It is important to note that the BWDPC surface area (SA), total pore volume (TPV), micropore volume (MPV), and elemental compositions of carbon, hydrogen, nitrogen, and oxygen were all examined

(v) Different adsorption parameters were employed to determine the CO_2 uptake by the BWDPCs. There are 288 data points and 344 data points from different publications for heteroatom-doped porous carbons

3. Proposed Method

Input features were correctly detected and labelled based on the data collected. Data preprocessing was carried out after the gathering of data to enable effective SVM prediction performance. Figure 1 illustrates the data processing and data classification methodology to improve the quality of information.

3.1. Data Preprocessing. The first stage in machine learning is data preprocessing. Many concerns must be resolved before any further analysis can take place. These include ensuring that the data is clean and free of noise or missing numbers. Machine learning algorithms are constantly being improved to be able to perform well in the presence of missing values or noise, but the quality of the outcomes is still affected by the input data.

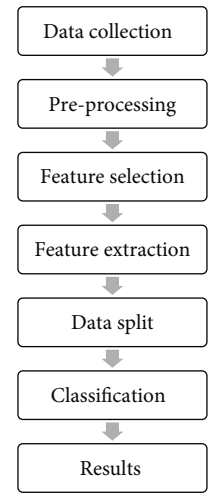

Figure 1: Proposed workflow schematic.

3.2. Missing Value Imputation. Our initial step is to deal with the issue of missing data and impute the values that were not found during our preliminary analysis of the data.

There are many ways to deal with the problem of missing numbers in weather data, some of which are more involved than others. In order to deal with missing values, it is helpful to know the reason for their absence in the dataset, and this is based on their unpredictability.

The last two types are the most challenging to work with since the substituted value may not accurately reflect the original observation. This is the most straightforward technique to deal with a missing value. There may be too few complete examples to justify removing partial features. It is also possible that the discarded values include valuable information, and deleting them could have a negative impact on the outcome.

We do not have to remove features that have missing values; instead, we can "impute" new values to the missing data. The apparent option is to remove the features with missing values, but this can result in the loss of valuable data. Because of this, we can utilise imputation methods to automatically fill in the blanks with new data.

This allows us to evaluate more characteristics rather than eliminate all the observations with missing values. We can use missing values. To ensure that the entire dataset is included, missing values might be inserted to ensure that the results are not skewed. It can, however, have a small impact on the final outcome. For those missing variables, we opted to use mean imputation to fill in those that were not included in the original dataset.

Means of observed values are utilised to fill in missing values in each feature in this method, which is one of the most accessible and often used strategies. It is worth noting that filling in the blanks is a critical part of data preparation because it serves as the basis for subsequent operations. From linear correlation to support vector regression, there are increasingly complex imputation approaches.

3.3. Feature Selection with Correlation. Selecting features that are not correlated with each other but still predictive of the class is what feature selection is all about. If a variable is not predictive of the class, it can be deleted. An evaluation of the dataset inner feature correlation and its contribution to classification models is carried out to establish the value of this task.

Data interdependencies can be assessed using Pearson's correlation coefficients, which are simple to calculate. Assuming x_i is the number of observations (i^{th}) and y is the class label, the Pearson correlation coefficient can be defined as

$$R_{(i)} = \frac{\operatorname{cov}(x_i, y)}{\sqrt{\operatorname{var}(x_i)\operatorname{var}(y)}}, \tag{1}$$

where cov is covariance and var is variance.

Mathematically, the complete formulation is

$$R_{(i)} = \frac{\sum_{k=1}^{m}(x_{k,i} - \bar{x}_i)(y_k - \bar{y})}{\sqrt{\sum_{k=1}^{m}(x_{k,i} - \bar{x}_i)^2 \sum_{k=1}^{m}(y_k - \bar{y})^2}}. \tag{2}$$

A correlation map is used in the implementation to demonstrate the correlation between the columns. One adsorption feature is dropped from each pair in this algorithm. A classification algorithm is then used to see how the classifier performs when we add a new subset to our dataset. A closer look at the strongly connected group of attributes is useful at this point. Because of this, feature selection by a correlation coefficient of adsorption relies heavily on trial and error and does not produce optimal results.

3.4. Recursive Feature Elimination with Cross-Validation. In most circumstances, RFE and cross-validation can be used to pick a new subset of characteristics for adsorption in most circumstances, because the preferred number of features is often unknown. Once the model has been fitted, cross-validation scores can be compared to determine the best number of features for classification accuracy. Prior to classification, RFE can be used to identify the intercorrelated features and patterns in the dataset. Unnecessary and redundant data are removed quickly with RFE. But there are certain disadvantages to this approach. It is important to think about computational intensity. Before training the data, the user must choose the number of features to be used in RFE. Other feature selection strategies have been employed to overcome this issue and arrive at the ideal dataset.

3.5. Feature Extraction. PCA is a popular feature extraction technique that uses principal component analysis to determine a lower-dimensional basis from the original dataset that captures most of the data variation. For the lower-dimensional basis, the correlated features are transformed into fewer uncorrelated ones by linear transformation into principal components.

The goal of PCA is to discover the lowest-dimension surfaces onto which to project the data in order to minimise the projection error. Using vectors, we may describe the lower-dimensional surfaces. Two conditions must be met for a surface to be considered good. The first two goals are to maximise anticipated variance and decrease mean squared error. All dimensions must meet these parameters. It is these dimensions or directions that account for the greatest amount of variance in PCA vectors, which are known as principal components.

PCA is a linear transformation that rotates the points into a new coordinate system, erasing the association between them in the mathematical sense. By projecting the data into a lower dimension and reducing the mean squared projected error, PCA performs the transformation by minimising the difference between the original and projected data. The formula for calculating the average squared projection error is as follows:

$$\text{Mean square projection error} = \frac{1}{m}\sum_{i=1}^{m}\left\|x^i - x^i_{\text{approx}}\right\|^2. \tag{3}$$

Component variance is calculated by ensuring that the mean squared projection error over total variance is less than 1% for the 99% criterion.

$$\frac{1/m\sum_{i=1}^{m}\left\|x^i - x^i_{\text{approx}}\right\|^2}{1/m\sum_{i=1}^{m}\left\|x^i\right\|^2} \le 0.01. \tag{4}$$

For a particular threshold α, the steps of the PCA algorithm are as follows:

Step 1: the mean should be calculated from the data

Step 2: data should be the focus

Step 3: take the covariance matrix and run it through

Step 4: eigenvectors must be computed

Step 5: the eigenvectors can be computed

Step 6: calculate the percentage of the overall variation that is accounted for

Step 7: in order to reduce the overall variance to less than 1%, choose a dimensionality that has the fewest components

A smaller base and less dimensionality are now possible. Reduced dimensionality using PCA can keep the variance and accuracy of the classifier but also helps learning algorithms run more effectively and reduce computation time because many features in real-world datasets are correlated or redundant.

3.6. Classification—Support Vector Machines. In fraud detection, identifying cancer cells from healthy ones, face recognition, weather forecasts, etc., SVM is a common classification algorithm. For this reason, the SVM is referred to as a supervised learning classifier since it uses data that has already been labelled by the supervisor.

In order to maximise speed while retaining generalisation for unknown data, classification methods are used. In other words, the model potential to generalise is compromised in favour of better fitting the data. Data classification is done by finding a hyperplane that separates the two classes in SVM. This method is summarised in a single sentence:

$$\hat{y} = \text{sign}\,(H(x)). \tag{5}$$

In this formulation, the decision function $H(x)$ is used. Any location on the separating hyperplane can meet the following requirement:

$$H(x) = w^T x + b = 0, \quad x, w \in \mathbb{R}^n, \tag{6}$$

and

$$b \in \mathbb{R}, \tag{7}$$

where x is feature vector, w is weight vector, and b is offset.

The hyperplane position in space is determined by the linear equation weight vector for adsorption. Weight vector is perpendicular to the hyperplane, and b is the hyperplane offset, or distance from the origin. The input space is divided into two halves by the hyperplane: $H(x) > 0$ in one half space and $H(x) = 0$ in the other. For all data points on the hyperplane, the critical property of this hyperplane is $H(x) = 0$. On this hyperplane, which is used to divide the test data into two groups, $H(x) > 0$ corresponds to a +1 label, and $H(x) < 0$ corresponds to a -1 label on this hyperplane.

$$\hat{y} = \begin{cases} 1 & w^T x + b > 0 \\ -1 & w^T x \quad + b < 0. \end{cases} \tag{8}$$

The margin of separation is defined as the distance between the nearest adsorption data point in the training set and the separating hyperplane. The hyperplane with the greatest separation between the two classes is unique and can only be identified by optimization, even when several hyperplanes satisfy the criteria. Maximising the largest margin of separation is essential because it boosts a model generalisation or ability to better handle noise in the test data, and the data points that are classified based on their position in the band are classified.

The term support vector is also a key component of this method name. A support vector is a set of data points whose distance from the separating hyperplane is equal to one after normalisation.

3.7. Parametric Modeling. An algorithm known as SVM can be used to forecast the future. However, it may require a lot of time and resources. A regularisation parameter known as C is used to adjust the model parameters in order to get the best results from SVM. There are two goals to be met: minimise the error term and weight vector norm and maximise the margin of separation. The regularisation parameter governs this trade-off. The SVM classifier performance can be significantly impacted by fine-tuning this parameter. Grid search is a common method for tweaking parameters in SVM, as there are few other options. The model is trained on a collection of hyperparameters to discover the best parameters for the given model before performing a grid search for parameter selection. An expensive and time-consuming method of searching huge datasets, grid search constructs many models with given parameter values and chooses the optimal one after comparing outcomes for all combinations.

In this paper, we present a method based on the parametric simplex method for exhaustively searching the solution path and determining the optimal regularisation parameter value. A parametric simplex approach can be used to obtain all possible values for the parameter in this work using the SVM algorithm, which is a linear programming problem. We can then select the best value from a small number of possible values.

The parametric simplex approach can be applied in a variety of ways, each with a somewhat different set of variables to update. The approach suggested in this paper solves the linear programming issue at a global level.

There are a few terms that need to be defined before we can get into the method further. Algorithms begin by solving augmented forms of the original issue to ensure that the problem can be successfully solved. The optimal values of the choice variables in the enhanced LP are the result of solving this problem. The LP corner-point solution is a simple one. Whether or not the basic answer is practical, it is referred to as a "basic, feasible solution."

The sole difference between the corner-point solution and a basic solution is the inclusion of slack variables. There are two types of variables in the corner-point solution: basic and nonbasic. These are the variables whose values are set to zero in the basic solution, while the remaining variables are considered nonbasic. The basis is a collection of all the variables that are essential to the model. When minimising the objective function, it is necessary to lower the coefficients in order to get the optimal value. The reduced cost vector is another word that needs to be defined.

Support vector machines with L1-norm kernels are used to classify the indivisible data and the problem is stated as

$$\text{Min}_{w,b,\zeta}\left\{\lambda_1 \sum_{i=1}^{l} |w_i| + \lambda_2 \sum_{i=1}^{l} \zeta_i\right\} \text{s.t.} y_i \left[\sum_{i=1}^{l}\sum_{j=1}^{l} w_i . k(x_i, x_j) + b \geq 1 - \zeta_i\right], \tag{9}$$

where $\zeta_i \geq 0$, $w_i \geq 0$, $\lambda_1 + \lambda_2 = 1$, and $\lambda_1, \lambda_2 \geq 0$.

A multiobjective problem can be solved in a variety of ways. The weighted sum of two goal functions that we are seeking to minimise simultaneously is the objective function. We are trying to figure out the best values for λ_1 and λ_2 to achieve this. Let the study set $\lambda_1 = \lambda$ and $\lambda_2 = 1 - \lambda$ to make the problem compatible with the form described in Section 4.

4. Results and Discussions

Section 2 shows the data collection, and the proposed SVM is compared with existing methods in terms of various performance metrics that include the accuracy, precision, and recall of the percentage error.

Figure 2 shows the results of precision between conventional machine models and proposed SVM. The results of

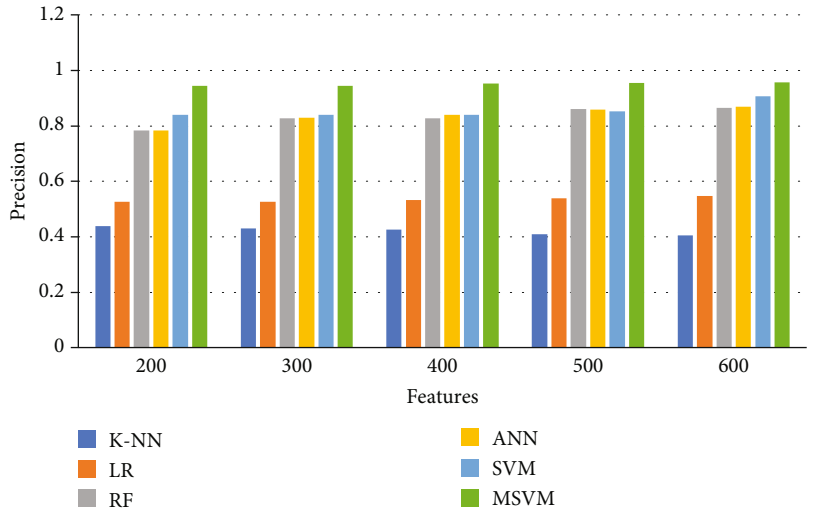

Figure 2: Precision.

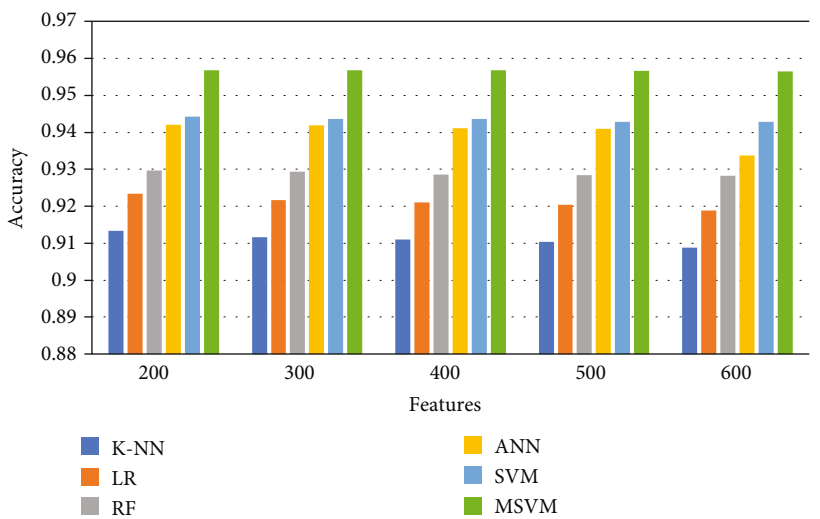

Figure 3: Accuracy.

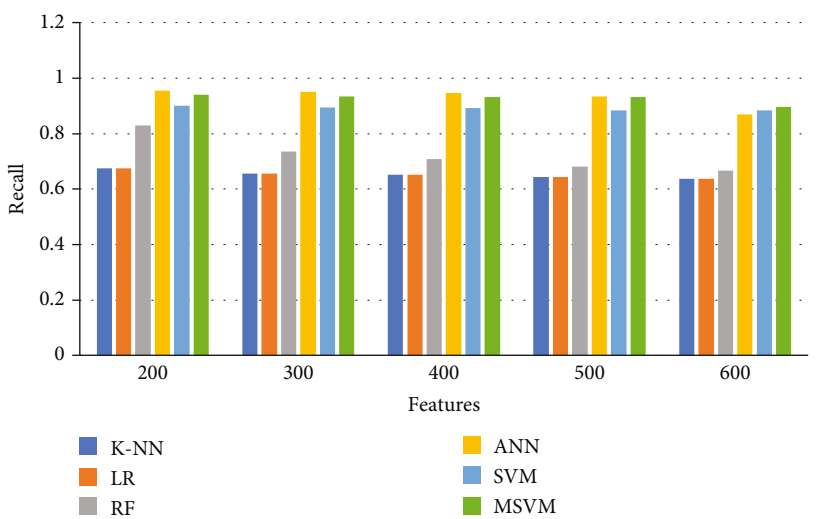

Figure 4: Recall.

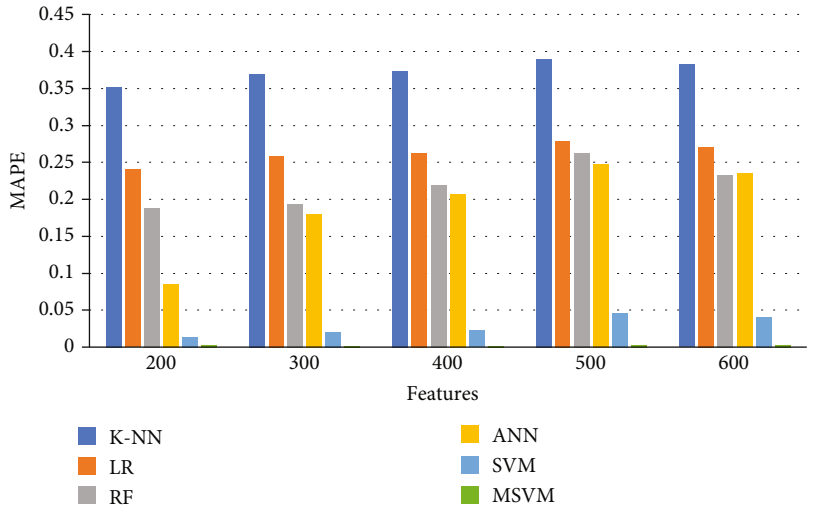

Figure 5: Mean average percentage error (MAPE).

the simulation show that the proposed SVM achieves a higher rate of segmentation performance with high precision than other methods.

Figure 3 shows the results of accuracy between conventional machine models and proposed SVM. The results of the simulation show that the proposed SVM achieves a higher rate of classification performance with high accuracy than other methods.

Figure 4 shows the results of recall between conventional machine models and proposed SVM. The results of the simulation show that the proposed SVM achieves a higher rate of segmentation performance with high recall than other methods.

Figure 5 shows the results of MAPE between conventional machine models and proposed SVM. The results of the simulation show that the proposed SVM achieves a reduced rate of MAPE than other methods.

5. Conclusions

An SVM-based multiobjective formulation is presented in this study, which shows how changes in composition, texture, and other adsorption characteristics affect CO_2 absorption. During training and testing, the machine learning classifier assists in the classification of diverse porous carbon materials. The simulation results suggest that the proposed method is more effective than existing ways of categorising CO_2 adsorption material porous nature.

In addition, these data-driven models provided certain mechanistic knowledge about the real CO_2 capture process, which raised confidence in their adoption because their findings and inferences were supported by the existing literature.

This study has provided us with a framework for our next steps, which include developing a strategy to maximise the CO_2 adsorption of BWDPCs by optimising the adsorption parameters and textural properties of the BWDPCs and testing the optimizer, which will be done by incorporating new experimental data points into the database and making it freely available for use by other researchers in the community.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding authors on reasonable request.

Conflicts of Interest

There is no conflict of interest.

References

[1] X. Zhu, D. C. Tsang, L. Wang et al., "Machine learning exploration of the critical factors for CO_2 adsorption capacity on porous carbon materials at different pressures," *Journal of Cleaner Production*, vol. 273, article 122915, 2020.

[2] X. Yuan, M. Suvarna, S. Low et al., "Applied machine learning for prediction of CO2Adsorption on biomass waste-derived porous carbons," *Environmental Science & Technology*, vol. 55, no. 17, pp. 11925–11936, 2021.

[3] X. Zhu, Z. Wan, D. C. Tsang et al., "Machine learning for the selection of carbon-based materials for tetracycline and sulfamethoxazole adsorption," *Chemical Engineering Journal*, vol. 406, article 126782, 2021.

[4] W. K. P. Wickramaarachchi, M. Minakshi, X. Gao, R. Dabare, and K. W. Wong, "Hierarchical porous carbon from mango seed husk for electro-chemical energy storage," *Chemical Engineering Journal Advances*, vol. 8, article 100158, 2021.

[5] C. Zhang, D. Li, Y. Xie et al., "Machine learning assisted rediscovery of methane storage and separation in porous carbon from material literature," *Fuel*, vol. 290, article 120080, 2021.

[6] S. Moosavi, O. Manta, Y. A. El-Badry et al., "A study on machine learning methods' application for dye adsorption prediction onto agricultural waste activated carbon," *Nanomaterials*, vol. 11, no. 10, p. 2734, 2021.

[7] M. I. M. Kusdhany and S. M. Lyth, "New insights into hydrogen uptake on porous carbon materials via explainable machine learning," *Carbon*, vol. 179, pp. 190–201, 2021.

[8] H. Mashhadimoslem, M. Vafaeinia, M. Safarzadeh, A. Ghaemi, F. Fathalian, and A. Maleki, "Development of predictive models for activated carbon synthesis from different biomass for CO2 adsorption using artificial neural networks," *Industrial & Engineering Chemistry Research*, vol. 60, no. 38, pp. 13950–13966, 2021.

[9] M. Rahimi, M. H. Abbaspour-Fard, and A. Rohani, "Machine learning approaches to rediscovery and optimization of hydrogen storage on porous bio-derived carbon," *Journal of Cleaner Production*, vol. 329, p. 129714, 2021.

[10] X. Zhu, M. He, Y. Sun et al., "Insights into the adsorption of pharmaceuticals and personal care products (PPCPs) on biochar and activated carbon with the aid of machine learning," *Journal of Hazardous Materials*, vol. 423, article 127060, 2022.

[11] X. Zhu, Z. Xu, S. You et al., "Machine learning exploration of the direct and indirect roles of Fe impregnation on Cr(VI) removal by engineered biochar," *Chemical Engineering Journal*, vol. 428, p. 131967, 2022.

[12] J. Li, X. Zhu, Y. Li, Y. W. Tong, Y. S. Ok, and X. Wang, "Multi-task prediction and optimization of hydrochar properties from high-moisture municipal solid waste: application of machine learning on waste-to- resource," *Journal of Cleaner Production*, vol. 278, article 123928, 2021.

[13] X. Zhu, X. Wang, and Y. S. Ok, "The application of machine learning methods for prediction of metal sorption onto biochars," *Journal of Hazardous Materials*, vol. 378, article 120727, 2019.

[14] W. Jiang, X. Xing, S. Li, X. Zhang, and W. Wang, "Synthesis, characterization and machine learning based performance prediction of straw activated carbon," *Journal of Cleaner Production*, vol. 212, pp. 1210–1223, 2019.

[15] J. Wang, X. Zhang, Z. Li, Y. Ma, and L. Ma, "Recent progress of biomass-derived carbon materials for supercapacitors," *Journal of Power Sources*, vol. 451, article 227794, 2020.

[16] P. S. Pauletto, S. F. Lütke, G. L. Dotto, and N. P. G. Salau, "Forecasting the multicomponent adsorption of nimesulide and paracetamol through artificial neural network," *Chemical Engineering Journal*, vol. 412, article 127527, 2021.

[17] M. Rahimi, M. H. Abbaspour-Fard, and A. Rohani, "A multi-data-driven procedure towards a comprehensive understanding of the activated carbon electrodes performance (using for supercapacitor) employing ANN technique," *Renewable Energy*, vol. 180, pp. 980–992, 2021.

[18] E. H. Cho, X. Deng, C. Zou, and L. C. Lin, "Machine learning-aided computational study of metal–organic frameworks for sour gas sweetening," *The Journal of Physical Chemistry C*, vol. 124, no. 50, pp. 27580–27591, 2020.

[19] N. Theamwong, W. Intarabumrung, S. Sangon et al., "Activated carbons from waste *Cassia bakeriana* seed pods as high-performance adsorbents for toxic anionic dye and ciprofloxacin antibiotic remediation," *Bioresource Technology*, vol. 341, p. 125832, 2021.

[20] X. Zhu, Y. Li, and X. Wang, "Machine learning prediction of biochar yield and carbon contents in biochar based on biomass characteristics and pyrolysis conditions," *Bioresource Technology*, vol. 288, article 121527, 2019.

[21] H. Wei, S. Deng, B. Hu et al., "Granular bamboo-derived activated carbon for high CO2 adsorption: the dominant role of narrow micropores," *Chem Sus Chem*, vol. 5, no. 12, pp. 2354–2360, 2012.

[22] M. R. R. Kooh, R. Thotagamuge, Y. F. C. Chau, A. H. Mahadi, and C. M. Lim, "Machine learning approaches to predict adsorption capacity of Azolla pinnata in the removal of methylene blue," *Journal of the Taiwan Institute of Chemical Engineers*, vol. 132, p. 104134, 2022.

[23] K. Jeyasubramanian, B. Thangagiri, A. Sakthivel et al., "A complete review on biochar: production, property, multifaceted applications, interaction mechanism and computational approach," *Fuel*, vol. 292, article 120243, 2021.

[24] Z. Hu, Y. Yuan, X. Li et al., "Yield prediction of "thermal-dissolution based carbon enrichment" treatment on biomass wastes through coupled model of artificial neural network and AdaBoost," *Bioresource Technology*, vol. 343, article 126083, 2022.

[25] H. Mazaheri, M. Ghaedi, M. A. Azqhandi, and A. J. P. C. C. P. Asfaram, "Application of machine/statistical learning, artificial intelligence and statistical experimental design for the modeling and optimization of methylene blue and Cd (II) removal from a binary aqueous solution by natural walnut carbon," *Physical Chemistry Chemical Physics*, vol. 19, no. 18, pp. 11299–11317, 2017.

[26] J. Baruah, C. Chaliha, B. K. Nath, and E. Kalita, "Enhancing arsenic sequestration on ameliorated waste molasses nanoadsorbents using response surface methodology and machine-learning frameworks," *Environmental Science and Pollution Research*, vol. 28, no. 9, pp. 11369–11383, 2021.

[27] H. Sui, L. Li, X. Zhu, D. Chen, and G. Wu, "Modeling the adsorption of PAH mixture in silica nanopores by molecular dynamic simulation combined with machine learning," *Chemosphere*, vol. 144, pp. 1950–1959, 2016.

[28] Z. Dai, Z. Chen, A. Selmi, K. Jermsittiparsert, N. M. Denić, and Z. Nešić, "Machine learning prediction of higher heating value of biomass," *Biomass Conversion and Biorefinery*, pp. 1–9, 2021.

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Research Article

Key Aggregation Cryptosystem and Double Encryption Method for Cloud-Based Intelligent Machine Learning Techniques-Based Health Monitoring Systems

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Cloud technology is a business strategy that aims to provide the necessary material to customers depending on their needs. Individuals and cloud businesses alike have embraced the cloud storage service, which has become the most widely used service. The industries outsource their data to cloud storage space to relieve themselves of the load of dealing with redundant data contents. This must be protected to prevent the theft of personal belongings, and privacy must be improved as well. Different research projects have been suggested to ensure the safe management of the information included within the data content. The security of current research projects, on the contrary, still needs improvement. As a result, this method has been suggested to address the security concerns associated with cloud computing. The primary goal of this study effort is to offer a safe environment for cloud users while also increasing the profit of cloud resource providers by managing and securely delivering data contents to the cloud users. The bulk of sectors, including business, finance, military, and healthcare industry, do not store data in cloud-based storage systems. This technique is used to attract these kinds of customers. Increasing public acceptance, medical researchers are drawn to cloud computing because it allows them to store their study material in a centralized location and distribute and access it in a more flexible manner. They were collected from numerous individuals who were being evaluated for medical care at the time. Scalable and enhanced key aggregate cryptosystem is a protected data protection method that provides highly effective security in the healthcare industry. When parties interested in a dispute disagree on the outflow of sensitive information, this technique manages the disputes and ensures the data security deployment of a cloud-based intelligent health monitoring system for the parties involved. The encrypted data structure of medical and healthcare prescriptions is recorded as they move through the hands of patients and healthcare facilities, according to the technique recommended. The double encryption approach is used in order to raise the overall degree of security. An encryption class is created by referring to the Ciphertext ID during the encryption procedure. The keyholder is a master secret key that facilitates in the recovery of the secret keys of various monsters and creatures by acting as a conduit between them. It is transferred and stored as a single aggregate for the benefit of the patient or customer in order to make decryption more convenient and efficient. A safe connection between cloud-based intelligent health monitoring systems and healthcare organizations and their patients may be established via the use of a key aggregation cryptosystem and a double encryption approach, according to the researchers. Because of this, when compared to earlier techniques, the findings reveal that the research methodology provides high levels of security in terms of confidentiality and integrity, in addition to excellent scalability.

1. Introduction

As with any relationship of agreement between two parties, cloud security is similar in that it requires confidence in the relationship of agreeing with each other, which manifests itself as sensitive data both statically and during transmission. Customers and service providers that interact with a cloud computing environment need a high level of confidence in the environment [1]. Because cloud computing incorporates a variety of local methods and draws in a large number of people with a variety of backgrounds, it has the potential to become very complicated. Private information on a differential scale is presently receiving a great deal of attention as a potential alternative for partition-based privacy models for privacy preservation. When it comes to cloud computing, security may be achieved via a variety of methods such as authentication, data integrity, and confidentiality [2]. This consists of providing individuals with on-demand and prior reservation-based access to combine computational and other resources, autonomics, the ability to categorize resources from potentially disparate clouds to produce the results of workflows, and the appropriate level of security and privacy. A powerful cloud-based operating system provider, a productivity suite provider, postal service providers, and storage providers are all investigated using this method [3]. A cataract is a significant and rapidly increasing worldwide health problem. The goal is to prevent cataracts from progressing further and to discover a treatment for them. The loss of privacy concerning the data of the users has an impact on the ability to provide the service properly in the cloud environment. Performing a comparative study of cloud-based privacy preservation methods provides a clear picture of the privacy issues and strategies that are being utilized for data preservation in the cloud. As a result, the data mining method coupled with optimization approaches is presented to address the issue of privacy preservation [4]. Consequently, the present study endeavours to resolve the security issues that have been previously addressed by introducing new methods. When it comes to avoiding security problems, the earlier-used methods provide superior results, but they may impair the overall performance in a variety of ways. This strategy is designed to maximize the security level and safeguard the cloud data contents in the study methods that have been recommended. The primary aim is to guarantee and offer a secure environment for data related to healthcare services and products. The fact that the apps are located in several places further adds to the public's worry about privacy [5]. In addition to storing data and providing flexible processing capacity, cloud computing helps to propel information technology (IT) to greater heights while requiring less initial capital expenditure. A company that operates its application in the public domain and outside of the firewall will raise knowledge about security and the issues that may arise as a result of that awareness. In the case of cloud computing, consumers may access resources from anywhere in the world at any time by connecting to the Internet, eliminating the need to deal with the real resource issues, such as physical and technical administration. Unlike traditional computer resources, cloud computing resources are dynamic and adaptable [6].

Because random number creation in symmetric key encryption techniques is readily recognized by the user, the One-Time Pad (OTP) generator is utilized by the majority of approaches in current research [7]. In cryptography, the One-Time Password (OTP) is an encryption method that cannot be broken. An encrypted plaintext is used in conjunction with a randomly generated secret key, also known as a one-time pad, in this kind of encryption [8]. In the next step, each bit or character of the plaintext is encrypted by adding it to the matching bit or character using a technique known as modular addition. Providing that the key is random, is at least as long as the plaintext, is never reused in whole or in part, and is kept secret, the resultant ciphertext will be almost difficult to decode and break into. It has also been shown that any cipher with the perfect secrecy property must employ keys that meet the same criteria as OTP keys to function properly [9]. One-time pads are information-theoretically secure in the sense that the encrypted message, referred to as the ciphertext, gives no information about the original message to a cryptanalyst other than the maximum length of the message that may be sent. A feature of the one-time pad that he coined "perfect secrecy" is that the ciphertext C contains no new information about the plaintext other than what is already known. Specifically, it is because every plaintext of equal length may be converted into any other plaintext if a genuinely random key is used only once, and all of the conversions are equally probable [9]. As a result, the chance of receiving a plaintext message M is the same as the likelihood of receiving a plaintext message M after the fact.

With the Diffie–Hellman key exchange protocol, it is possible to arrive at a shared secret key by exchanging text messages over an insecure medium without having to meet in person first. The Diffie–Hellman key exchange protocol is confined to the exchange of just one key between participants. In the absence of entity authentication, this protocol is susceptible to man-in-the-middle attacks and impersonation attacks, among other things. It has been noticed that Nanli's protocol, despite its efforts to remove the man-in-the-middle attack, is still vulnerable to the impersonation attack. This study proposes an enhanced key exchange strategy based on a third-party authentication system in order to deal with this vulnerability.

The entropy of the plaintext is denoted by M, while H(M|C) is the conditional entropy of the plaintext when denoted by the ciphertext. Perfect secrecy is a strong concept of cryptanalytic difficulty in the cryptographic community. Symmetric encryption methods that are now in use complicated patterns of substitution and transpositions [10]. It is not known if there may be a cryptanalytic method that can reverse these changes without knowing the key that was used during the encryption process, for the best of this presently in use, which is the best of the best. Asymmetric encryption

methods are based on mathematical problems that are believed to be difficult to answer, such as integer factorization and discrete logarithms, which are both difficult to solve. The fact that these issues are difficult is not proven, and a mathematical breakthrough may render current systems susceptible to assault. OTP, in contrast to traditional symmetric encryption, is impervious to brute force assaults because it maintains complete secrecy, unlike ordinary symmetric encryption [11]. Attempting all keys just results in a slew of plaintexts, each of which is equally likely to be the real plaintext. When there is known plaintext, such as a portion of the message being known, brute force assaults are ineffective because the attacker is unable to get any information about the portions of the key that are required to decode the remainder of the message from the plaintext. All that will be revealed by these parts are just those parts of the key that correspond to the users, and since each user corresponds to a single part of the key, no portion of the key is reliant on any other part of the key [12]. Providing a safe environment for cloud users, as well as increasing the profit of cloud resource providers, is the primary goal of this study effort. This is accomplished via the secure handling and provisioning of data contents. Increasing public acceptance, medical researchers are drawn to cloud computing because it allows them to keep their study material in a centralized location and share and access it from anywhere at any time [4].

This technique, known as the Diffie–Hellman key agreement protocol, allows two parties to exchange secret keys over an unprotected channel without having to physically meet in person. The secret key is used for further encryption and decryption of the message and the cypher text, respectively, once they have been encrypted. When it comes to key management, there are several obstacles to overcome [13]. To ensure safe communication, every pair of users' need have a unique key, which is the first obstacle.

As a result, if a communication network has n users, then each member of the network must hold $(n-1)$ keys in their possession. A big number of members in a network make it very difficult to keep track of such a large number of keys in a secure manner. During the course of public key cryptography, the participant is required to identify two separate keys for the purposes of encryption and decryption [14]. These two keys should be multiplicative inverses of each other, and they should be the same. The most significant drawback of public key cryptography is that the encryption and decryption processes are both excessively slow. Man-in-the-middle attacks, in which a trusted third party takes on the role of the man in the middle, are also a concern in public key cryptography. In a man-in-the-middle attack, a third party (C) impersonates itself from A to B and B to A communication channels [14]. In this method, both parties communicate with one another via the intermediary of third-party C. The solution to this challenge is to provide a means of authentication between parties who are talking with one another.

On the subject of group key management, a number of systems have been proposed. Researchers examined the most current developments in security parameters in key management, as well as techniques for distributing session keys in a safe manner, and they also explored the topic of key refreshing. In addition to offering an efficient method for many-to-many and one-to-many communications, multicast or group communication facilitates the delivery of material on a broad scale.

In symmetric key cryptography, one of the most difficult problems to solve is the establishment of a secret key between two participants [15].

It is necessary to gather medical information from a variety of patients so that it may be evaluated to anticipate the information about a medical cure. It is critical to store and safely retrieve data so that a security breach does not result in an incorrect prediction or analysis. Health care data are stored and managed securely and confidentially in cloud computing storage, which is a concentrated area of storage [16]. Novel methods for protecting healthcare data stored in the cloud are being suggested in this study. By adopting new techniques, the potential security breach that might occur when sharing the cloud-stored healthcare data with various researchers is mitigated to the greatest extent possible. Because of the high amount of information being handled, it is not possible to ensure complete security improvement. Because of advancements in technology, the hacking process has become more accessible, which must be avoided to avoid data corruption and theft [17]. The current study studies do not address the privacy concerns that would arise if sensitive information, such as the legitimacy and ownership of the associated data, was disclosed.

It is necessary to exchange keys in a certain mathematical configuration in which there is no need for user authentication. Cas Cremers gave a presentation on how to enhance the standard for key management, which was based on his study.

Man-in-the middle attacks on the Diffie–Hellman protocol are common, and it is required to create a solution to remove man-in-the-middle attacks in order to ensure the safe transfer of the secret key between two parties using this protocol.

Several strategies have been proposed to provide the key exchange with user authentication in order to remove the man-in-the-middle threat by using hashing algorithms [18]. It is addressed in this work how the technique given by Nanli [19] for removing the man-in-the-middle attack may be used, the issue of impersonation by an authenticated member is discovered, and a solution to the identified assault is proposed.

The goal of a Diffie–Hellman key exchange is to provide parties with the option to generate a symmetric session key via an insecure communication channel. In addition, a symmetric key is exchanged with a session key for the purpose of encrypting and decrypting data. The discrete logarithm issue has an impact on the strength of the secret key produced in the Diffie–Hellman protocol [20]. In reference, the discrete logarithm issue is described as the amount of security that protects the deducing of the key from being compromised. Suppose "a" is a number, and the power modulo p of this number creates all integers from 1 to $p-1$; in this case, "a" is known as a primitive root or a

generator of the prime number "p." The numbers generated from 1 to p – 1 are as follows: a (mod)p, a2 (mod)p, . . . ap-1 (mod)p.

These numbers, numbered from 1 to $p-1$, create a permutation of sorts. For an integer b, b: bp, a prime number "p, and a generator "a of prime number "p, the expression b = ai (mod)p is produced as b = ai (mod)p, where 0 I p and 1 I p are positive integers $(p-1)$.

The issue of discrete logarithm of integer "b" on base "a" modulo p is referred to as I in this context. This value I may be represented by the notation d.loga, p (b).

Similar to the description in reference, the key exchange protocol is defined by utilising two public parameters, which are known as a prime number supplied as "q" and an integer given as "." The integer "q" is generated by the provided integer "q."

User A chooses a one-time random number (private key) XA such that XA q computes the public key parameter.

YA = [(X A)]mod q by multiplying YA by q. In a similar manner, user B chooses a new random integer as its private key, and user B computes its public key as YB = [(X B)]mod q by multiplying the private key by the modulus q.

X values are kept private on both sides, while the Y values are made publicly visible to the other user on the opposite side. The key for user B is determined as k = [(YA) (X B)] mod q, where q is the number of users.

2. Related Work

Hsiao Ying Lin and Wen GueyTzeng are two Taiwanese artists [21]. It was initially introduced as a technique known as distributed secured data storage, which counts the recovery process in a cloud database by the use of technologies known as encryption, according to its creators. It is possible to combine forwarding and encryption techniques, as well as an encryption mechanism, into a single package using this technology. There are a plethora of methods accessible, each of which includes retrieval approaches as well as cloud data storage capabilities. Tseng et al. [22], when it comes to discussing how to share data with other users in a safe, efficient, and adaptable manner in cloud data storage, have come up with a novel approach. It was discovered that the investigators employed a public key cryptosystem to produce ciphertexts that were all the same size input, which allowed them to grant operational decryption privilege to ciphertexts in response to a user's request for decryption rights. It has been shown that employing cryptography aggregate key techniques in cryptosystems, it is possible to compress the secret keys used in the system. As a result of utilising this strategy, which aids in the safe storage of data, the amount of storage space available will be reduced only when all users are using the same set of privileges and key sharing [23]. Because of the restrictions imposed by this method, it can only be used with certain kinds of encrypted communications. We calculated an effective pairing-based PPDP approach, according to Huaqun Wang and Zhang [24] in order to assure security in cloud data communications. When a customer is unable to do a remote check on their data in public clouds, they must be aware of their data ownership in public clouds. This technique is divided into three parts: the model of the PPDP system, the design process, and the security model. The notion of bilinear pairing is used to build and execute an efficient PPDP protocol, which is then put into practise. Performance and security studies have been conducted to ensure that this protocol is both efficient and secure [25].

In [26], the development of an attribute-based data interchange system for the smart grid is now underway. Not only has the data been evened out but also the access criteria have also been concealed from the view of grid staff throughout the course of the data exchange. Although both policy privacy and data privacy are protected under this method, the latter is more difficult to achieve. It is feasible to convey the access policy via the use of a number of arbitrary access equations. This increases the expressiveness of the policies as a consequence of the transformation. Additionally, the security is reinforced such that data that are to be transferred cannot be decrypted by a key generation centre that is not authorized to do so or by grid management systems that do not retain the data. Delegating the exceedingly labor-intensive procedures of decryption to more powerful grid-managed systems that are more efficient reduces the irregularities in the receivers' calculations as well as their overall performance. Gopinath and Geetha [27] are two of the most recent publications in this field. The development of an auditing framework for cloud storage systems, as well as an auditing protocol that is both effective and privacy-preserving, have both been presented in this study [28]. It has been improved to incorporate an auditing protocol to ensure that data dynamic operations are maintained in a way that is both provably safe and efficient in the arbitrary oracle modelling context. A trusted organizer or any other middleman is not required for the usage of this auditing protocol, which enables for batch auditing of several clouds and different owners [29]. The simulation findings and analyses reveal that the suggested auditing protocols are efficient and secure and that they, in particular, lower the computational expenses incurred by auditors in the course of performing their duties. In [19], a role-based encryption (RBE) paradigm, which integrated cryptographic approaches with a system known as role-based access control (RBAC), to protect sensitive information (RBAC) was suggested. On the basis of this approach, a secure RBE is provided which is based on hybrid cloud storage planning and provides an organization with the ability to store data safely in the public cloud while simultaneously maintaining the confidentiality of the company's information in a private cloud environment [30].

Waddington and Smith [31] addressed the difficulties and possible solutions associated with giving access to research results and storing them for long periods of time, which are mostly reliant on research data. Cloud storage and compute services are an ideal alternative for storing and preserving research data since they provide ready-to-use storage and computation services. Cloud infrastructure is more scalable and may be implemented on demand as compared to the construction of infrastructure inside a company, which frequently requires considerable upfront

investment and extensive lead times [32]. The use of commercial cloud services, in particular, presents concerns about cost-effectiveness, trust, and governance, as well as obstacles with regard to service quality. In the case of data that are kept in the cloud, this approach identifies a collection of thorough case readings for scientists and researchers who are conducting a data-intensive study and demonstrates the questions that will be examined throughout the process. In the next step, the researchers evaluate the feasibility of developing a database system that meets all of the criteria. It is planned to implement a hybrid cloud, which would mix internally managed storage, cloud storage, and cloud services into a single unified storage area network (SAN) to improve performance. The content is sent to storage providers in accordance with a rule-based distribution technique. According to Lees et al. [33], a cloud-based storage system is presented that enables the outsourcing of dynamic data. The owner is able to preserve and retrieve data stored by the cloud service provider, as well as produce new data in the cloud storage system as required. Individuals may be certain that they are getting the most up-to-date version of the outsourced information thanks to their system, which is accessible only to authorized users. Kumar et al. [34] presented a CPABE system with multiple authorities that contains the following features: the system does not require a fully trusted central authority, and each attribute authority independently issues secret keys to users; second, each attribute authority can dynamically remove any user from its domain, ensuring that the revoked users are prevented from accessing subsequently outsourced data; and third, cloud servers can update encrypted data from the current period to the next period, ensuring that the revoked users are prevented from accessing subsequently outsourced data [35]. The integration of information and communication systems has helped a number of real-time and mission-critical applications, such as weather monitoring, flood detection, and emergency response, among others. Healthcare computer systems have gained a great deal of attention in recent years, and a growing number of institutions are implementing healthcare solutions to extend and enhance their services while keeping the total cost of ownership as low as possible [36].

Ultimately, the purpose of healthcare computer systems is to provide its users with easy and quick access to healthcare data and services, regardless of when or where they are accessed. This aim may be achieved in part via the use of cloud computing and its business model, which allows these services to be made accessible on a larger scale and at a more affordable price than would otherwise be feasible. The effect of this is that the majority of healthcare companies are apprehensive of using cloud-based solutions due to the possibility of data security and privacy concerns. Consequently, healthcare systems and services are now delivered through the public or private cloud in a cloud computing environment, rendering them vulnerable to a broad variety of security issues, including identity theft and fraud. A considerable chance exists that unauthorised users may seek to get access to sensitive health information, which might result in serious data security and privacy concerns. When it comes to healthcare data in cloud computing environments, the proposed concept describes a study of the security and privacy challenges that must be addressed. It also proposes a solution that will prevent unauthorised access to data by introducing an access control mechanism that can act as a security layer on top of all cloud service models, which can be implemented as a cloud service model. As a result, new techniques of securing healthcare data that are stored in the cloud are being examined. If new security approaches are used, they may help to avoid security breaches from happening when cloud-based stored healthcare data are shared with a large number of researchers. In light of the large quantity of information that must be managed, it is impossible to ensure comprehensive security enhancement. As technology advances, it will become simpler for hackers to infiltrate systems, which must be prevented in order to prevent data damage and theft from happening. The present research efforts are hindered by privacy issues, since sensitive information such as the validity and ownership of the linked data would be made public if the research work was released in its current state. Data owners have divided their current work files into a number of blocks, which will be retained in the index tree structure for future reference. As a consequence of the way the current technique is working, the following issues have arisen. Overhead in calculation has increased. Storage capacity is being used more often. Depending on whether or not the CSP is acting as a malicious provider, it is conceivable that the data kept on the server may get compromised. This must be avoided in order to ensure server security. The recovery of content from a cloud server that has gone down is a difficult task that must be conducted with more care in order to avoid content loss.

3. Materials and Methods

Cloud customers, as well as cloud service providers, have identified several difficulties [37]. Assurance of storage process and sharing are done in a secured manner [38]. Many current research projects have traditionally been made accessible in a secure cloud computing environment. However, as a result of maintaining a mostly conventional methodology, it fails to provide security. The previous efforts that did not include safety precautions have likewise deteriorated in certain factors. The IDHKE is being created in this piece of the proposal, and the data contents are being exchanged securely with the end users from a cloud server, which is being constructed. As a result, the sharing of secret key information is done safely. By choosing one random prime number for each parameter value and master secret key, secure key creation may be accomplished which is difficult for hackers to crack. Secure data transfer is, therefore, guaranteed in the suggested technique of correctness and dependability in the authentication process.

The transparent data encryption feature of Microsoft SQL Server 2008 was introduced with the release of SQL Server 2008. This feature enables the SQL Server to encrypt data as it is written to the server's hard disc, and the SQL Server decrypts data as it is read from the hard drive into the server's memory. The benefit of using this approach is that

you are able to encrypt all data without causing any changes to the data in any way. This function also safeguards all of your data when it is backed up since the backup is encrypted as well as the original. Instead of encrypting the data contained inside the blocks of data, this encryption is accomplished by encrypting the blocks of data themselves. It is important to note that when data are encrypted, just the data contained inside the table is encrypted, while TDE will encrypt the metadata about the tables, as well as the white space in the data pages, among other things.

The disadvantage of employing transparent data encryption is that if someone is able to get access to your SQL Server by conventional methods, or by using something such as a SQL Injection, they will still be able to extract the data from your SQL Server by just querying the data in your SQL Server.

Additionally, transparent data encryption will increase the CPU burden on the SQL Server since each data page that is read from or written to the disc must be encrypted. Transparent data encryption is a good thing. On systems with a high level of demand, this might result in a significant increase in CPU resources. Transparent data encryption is a feature that is incredibly simple to enable. Simply right click on the database in SQL Server Management Studio and choose Properties from the drop-down menu. Then, click on the choices tab and go to the bottom of the option list to confirm your selection. When you do this, the transparent data encryption option for this database will be enabled.

3.1. Methodology of Secured Data Transmission. The improved data transmission with secure key algorithm (IDTSK) is developed in this piece of the proposal; the data contents are exchanged securely with the end users from the cloud server, which is being built. As a result, the sharing of secret key information is done safely. By choosing one random prime number for each parameter value and master secret key, secure key creation may be accomplished that is difficult for hackers to crack. As a result, the suggested technique of accuracy and reliability authentication ensures safe data transfer of all information. Figure 1 represents the overall proposed work.

As outlined below, the suggested approach will be examined in more depth in the following sections.

3.2. Overall System Setup. The four main organizations in the system are comprised of four important components: The Central Authority (CA), The Cloud, The Data Owners (DOs), and The Data Receivers (SDRs) [36].

Caution: the cryptographic key is assigned to a user following a set of characteristics, and the Central Authority divides the key into two components or sections (CA). The first is known as a Secret Part Key (SPK), and the second is referred to as a Security Device Key (SDK), and both are used for storing sensitive information in a secure manner inside a limited computer device [35]. Management of each secured user device is the responsibility of CA and the associated SDK. If, for example, during a specific phase of SDK update, a new SDK is generated in the security device's CA, and the

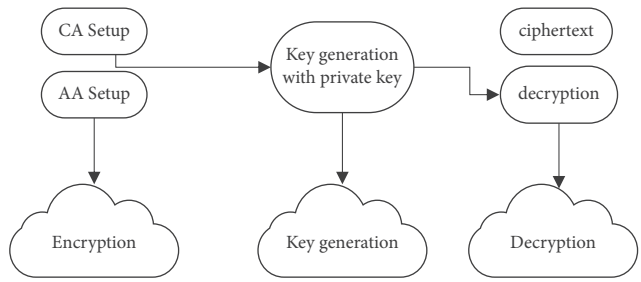

Figure 1: Overall proposed work.

encryption key is transmitted to the cloud once again; this is referred to as a "hard reset."

To guarantee that the data are secured, all encrypted shared data are stored in a semitrusted party in the cloud, with the users' Universal Identity (UID) within the table being saved as well as the encryption key when necessary. In the case that the DR shares encrypted data with the proxy cloud via the DR queries, the proxy cloud re-encrypts the shared data with the appropriate key and sends the encrypted shared data back to the DR. Ownership of data is a term used to describe the sharing of information among data receivers (SDRs) (DO). The CPABE encrypts data before sharing it with other users, in line with the organization's access policy. It is referred to as the user in this case since it is used to refer to the data exchange between a cloud and an individual user. When DR data are shared, decryption from the cloud is required, which results in ciphertext with an entirely new encryption key. SPK decodes SDRs' security device-encrypted ciphertext after determining whether or not SDRs' attribute set access policy has been met. SDK never reveals anything during decryption, and a process of partial decryption is removed out of the security device and performed outside of the security device to ensure that no sensitive information is exposed [32]. Contact with the CA and the use of a new security device if a security device has been lost or stolen are required for the revocation of DR to occur.

In q prime order of H_l bilinear group, h is a generator of Hl. Additionally, the bilinear map denotes e: $H1 \times H1 \longrightarrow H2$. The size of the groups is determined by a security parameter l. Define the Lagrange coefficient $\Delta_{j,p}$ for $j \in A_q$ and a set, S, of elements in Aq: $\Delta_{j,p}(y)$ = organized as CA setup, AA setup, secret key generation, data encryption, and data decryption.

3.3. Initial System Setup. The CA setup algorithm needs to run for CA setup as input from a parameter of security. H and H_U are a couple of multiplicative groups chosen by CA with similar p prime order as well as a bilinear map: $H \times H \longrightarrow H_U$, a couple of system parameters as of the d maximum tree depth and the maximum node cardinality num.

The following are steps for the algorithm to proceed. Thus, the universe of real attributes $W = \{1, \ldots, m\}$ and a (num −1-sized universe of dummy attributes $v = \{m + 1, \ldots, m+$ num $-1\}$. In sequence, a $(e,$ num$)-$universal access

tree T is used. Procedures' implicit inputs are assumed to be e, num, v, v^*, U. Now, for each real attribute, $j \in u$, choose a set of $|U|$ numbers $\{u^* k_x\} x \in \Phi_T$ uniformly at random from Z_p. Furthermore, for each dummy attribute $j \in u$, choose a set of $|\Phi_T|$ numbers $\{t^*_{\text{jx}}\} x \in \Phi_T$ uniformly at random from Z_p. Finally, choose y uniformly at random in Z_p. Equations (1) and (2) define the public parameters PK:

$$\text{GPP} = f(h,h)^z, \left\{U_{ky} = h^{u_{kz}}\right\}_{j\in u, x\in\psi_T}, \left\{U = h^{u'} | y\right\}^a_{k\in v, y\in\phi_u}. \quad (1)$$

The master key MK is

$$y, \left\{t_{j,x}\right\}_{j\in u, x\in\Psi_T}, \left\{t^*_{jx}\right\}_{j\in u, x\in\Phi_T}. \quad (2)$$

CA accepts both user registration and AA registration as forms of registration.

Every user is required to enroll in CA at a system startup to be able to access certain features. A unique identifier (uid) is given to a lawful user on a system by the system administrator. Two random numbers are produced in every user uid, such as u "uid Zp with secret keys worldwide and, in turn, produces the global public keys for the following.

AA registration: when the system is first started, the CA must be registered with every AA. On the legal authority system in AA, a global attribute authority is issued worldwide by the CA to identify the AA for the first time. Other global public/secret keys, such as (GPK "uid" "GSK" "uid"), are supplied from CA to each user in conjunction with AA "aid." In addition, a verification key is provided to AA aul for use in validating the user's certificates issued by the CA once they have been granted. Attributes' set is denoted by S_{aid} in every attribute authority of AA_{aid} as 3 equations. Three random numbers $\alpha_{\text{aid}}\beta_{\text{aid}}\gamma_{\text{aid}} \in \text{Zp}$ are chosen along with the authority secret key:

$$\text{SK aid} = (\alpha_{\text{aid}}\beta_{\text{aid}}, \gamma_{\text{aid}}). \quad (3)$$

"aid" represents data encryption, "aid" represents attributes differentiated by "aid" from multiple AAs, and "aid" represents attribute revocation for "aid." According to (4), the creation of the public key PK "aid" occurs as

$$\text{PK}_{\text{aid}} = \left(e(g,g)^{a_{\text{ald}}}, g^{\beta_{\text{aid}}}, g^{1/\sqrt{T}\,\text{aid}}\right). \quad (4)$$

Equation (5) gives a generation of the public attribute key on every attribute $x_{\text{aid}} \in S_{\text{aid}}$ as

$$\text{PK}_{x_{\text{aid}}} = \left(\text{PK}_{1x_{\text{aid}}} = H(x_{\text{aid}})^{v_{x_{\text{aid}}}}, \text{PK}_{2,x_{\text{aid}}} = H(x_{\text{aid}})^{v_{x_{\text{ait}}}}\gamma_{\text{aid}}\right), \quad (5)$$

where $\text{VK}_{x_{aid}} = v_{x_{\text{aid}}}$ are the version key of attribute implicitly. All the public attribute keys $\left\{\text{PK}_{x_{\text{aid}}}\right\}_{x_{\text{aid}}\in s_{\text{aid}}}$ are published on the public bulletin board of the ACA_{aid} incorporated along with public key PK_{aid} of AA_{aid}.

3.4. Key Generation in the Proposed Structure. Authentication of every user uid is needed on AA_{aid} in before entitling a few attributes. AA_{aid} receives the Certificate (uid) from submission of the user and, in turn, authentication of the user by AA_{aid} via CA offering verification key. On authentication of AA_{aid}, attributes' set $S_{\text{uid.aid}}$ is entitled to the user uid accordingly with its role otherwise administrative domain identity else it exit. In turn, the users' secret key $\text{SK}_{\text{uid,aid}}$ is generated by AA_{aid} on execution of the algorithm secret key generation SKeyGen. An attribute set of a user uid is considered. A private key D is the output of the key generation algorithm enabling A to decrypt a message encrypted under a (d, num) bounded access tree T' iff $T'(\gamma) = 1$.

The algorithm proceeds as follows. In all users, a polynomial q_x is chosen randomly among every nonleaf node x in the universal access tree T. From the source of root node r, polynomials are selected, $c_x = \text{mum} - 1$. The threshold value is maximum than degrees x of the polynomial q_x for each x. Complete definition of other points of the polynomial q_r, randomly, is done as c_r for the root node r by fixing $\text{qr}(0) = y.q_x$ which is defined completely by selecting c_x other points in random for else nonleaf node x as fixing $q_x(0) = q_{\text{parent}}(x)(\text{index}(x))$. In a sequence of polynomials determined, secret values to the user are followed as

$$\left\{D_{jx} = g^{q_x(j)/L_{\text{jx}}}\right\}_{j\in u, x\in\Psi_T}, \left\{D_{j,x} = g^{4x(\theta)/r_{jx}{}'}\right\}_{j\in u^*, x\in\Phi_T}. \quad (6)$$

Decryption key D is obtained from the secret values' set. A (d, num) bounded access tree T are selected first for encryption of a message $\in\in\text{GPP}$ by the encrypter ε. Real attributes are assigned to the leaf nodes in T'.

Message M with the access tree T' can encrypt. On demand, normal forms get encrypted. A map between the nodes in T' and the universal access tree T are defined by ε. For each nonleaf node x in T', ε chooses an arbitrary $(\text{num} - k_x)$-sized set ω_x of dummy child nodes of map (x) in T. Let $f(j,x)$ be a Boolean function such that $f(0,x) = 1$ if a real attribute $j \in U$ is associated with a leaf child of node $x \in T$ else 0. Choose a random value $s \in Z_p$, and equation (7) gives the ciphertext E as follows:

$$< T', E' = m > Y^5, \left\{E_{j,x} = T^s_{j,\text{map}(x)}\right\} j \in u, x \in \Psi_{T'}: f(j,x) = 1\left\{E^*_{j,x} = T^{*s}_{j,\text{map}(x)}\right\} j = \text{att}(z): z \in w_x, x \in \Phi_T. \quad (7)$$

Any concerned encrypted data are queried from every legal user in the system. Decryption algorithm decrypts ciphertext from the server depending on the data received via secret keys as of various AAs. Ciphertext E defines user satisfied attributes in access structure and so the content key is used by the user. Ciphertext E, D private key, and a node x in T_0 give input of a recursive algorithm in decrypt Node (E, D, x). Group element of G^2 or $\perp$ are output. Initially, x is

a leaf node is considered. Let $j = \text{att}(x)$ and w be the parent of x. Equation (8) represents the decrypt node:

$$\text{if } j \in \gamma \text{ It reduces to } e(g,g)^{s.t\ j\,\text{mape}\,w)} \text{when } j \in \gamma. \quad (8)$$

Now, consider the recursive case when x is a nonleaf node in T'. The algorithm proceeds as follows. For all nodes z that are children of x, it calls DecryptNode (E, D, z) and stores the output as F_z. Additionally, for each dummy node, $z \in \omega_x$, where ω_x is a select set of dummy nodes of the map (x) in T chosen by the encrypter, it invokes a function Decrypt Dummy (E, D, z) that are defined below and stores the output as Fz. Let j be the dummy attribute associated with z. Then, (9) shows

$$\text{Decrypt Node}(E, D, x) = e\left(D^* j_{\text{jmap}(w)}, E^*_{j,x}\right), \quad (9)$$

which reduces to $(g,g)^{s.4\,\text{map}(x)}(\theta)$. Let Ωx be an arbitrary k_x-sized set of child nodes z such that $F_z \neq \perp$. Furthermore, let S_x be the union of the sets Ωx and ω_x. Thus, we have that $|S_x| = \text{num}$. Let $g\hat{} = e(g,g)$. If no k_x-sized set x exists, then the node x was not satisfied and the function returns $\perp$. Otherwise, compute the following equations:

$$\prod_{z\in\Omega_x} F_z^{\Delta_l s'_1(a)} \prod_{z\in\omega_x} F_z^{A_t \cdot s'_k(0)}. \quad (10)$$

Return the result. Now that we have defined decrypt node, the decryption algorithm simply invokes it on the root r'of T'. Observe that DecryptNode $(E, D, r') = e(g,g)^{\text{sy}}$ iff $T'(\gamma) = 1$ and note that

$$F_r, = e(g,g)^{s.q_{\text{map}(r\eta)}(0)} = e(g,g)^{s\cdot q_r(0)} = e(g,g)^{\text{sy}}, \quad (11)$$

where r is the root of the universal tree T.

Since $E' = M \cdot e(g,g)^{\text{sy}}$, the decryption algorithm simply divides out $e(g,g)^{\text{sy}}$ and recovers. M.

In asymmetric encryption, in 1976, the key exchange is performed by the Diffie–Hellman algorithm designed by Whitfield Diffie and Martin Hellman. It removes the necessity of transferring keys among a couple of communication parties. A shared secret key is possible to generate every party on data encryption and data decryption. Diffie–Hellman key exchange is done securely as of various security protocols and services in reliable communication. A random parameter is chosen for the algorithm inefficiency. New shared keys are generated randomly for the exchange of information among the receiver as well as the sender and the receiver. Thus, various ciphertexts are generated at a time of a similar message. Several attacks are prevented on utilising this scheme. "q" is a prime number, and "a" is a primitive root which is selected by the basic version of the Diffie–Hellman algorithm on condition q > a. The powers of "a" generate all integers from 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, ... All integers from 1 to p − 1 are generated by aq-1 mod q. In this method, the first user chooses a private key by selecting a random natural number I from a hat. A mod q is used to compute the public key for many users with the same name and password. Similarly, the second user chooses the letter j for its private key. It is the same process that was used to create the first user public. The public keys of the two users are then exchanged between them. To calculate the shared secret key, each user utilizes its private key in conjunction with the public keys of the other users. Encryption and decryption are accomplished with the help of this secret key (Algorithm 1).

Because the private keys I and j are not sent and thus cannot be intercepted, only the people involved in the communication are aware of them. As a result, only the people involved in the communication may compute the shared secret key. However, there is still no way to authenticate the people who are interacting since their identities are not connected to the keys that they are sharing. As a result, the algorithm is vulnerable to man-in-the-middle assaults. Improved data transmission with secure key algorithm (IDTSK) describes how public key certificates and digital signatures may be used to protect against these types of attacks. Messages can be encrypted multiple times, yielding the exact cryptic text because the shared key remains constant during the session. To discover connections between plaintext and encrypted text, it is necessary to look for patterns that appear often in the ciphertext. To protect against known-plaintext attacks, it is necessary to include a random component in the key agreement procedure so that a new ciphertext is produced even when the same plaintext is encrypted several times.

4. Implementation

When compared with the suggested technique, the experimental findings are verified among the existing methodologies. The research performance evaluation is achieved by matching the current technique with a particular parameter on the basis of the data collected. The improved data transmission with secure key algorithm (IDTSK) approach, which was created in an earlier manner, is widely used in public key cryptosystems today. In comparison to the rest of the class, it achieves a superior encryption message identification and public key via ciphertext. The suggested study, IDHKE, is being developed in order to provide substantial security for health-related data. The following criteria are taken into consideration for attaining performance: resource utilization rate, integrity, secrecy, and degree of user satisfaction.

4.1. Confidentiality Comparison. Confidentiality values are analyzed among proposed IDHKE against existing methods improved data transmission with secure key algorithm (IDTSK) are tabulated in Table 1. In scenario of delegation ratio 0.9, 98% confidentiality is attained in IDHKE.

The confidentiality results of the prevailing improved data transmission with secure key algorithm (IDTSK) technique against the proposed IDHKE technique are shown in Figure 2. Delegation ratio is represented in X-axis and confidentiality is represented by Y-axis. The proportion of the delegated cipher text classes to the classes entirely is referred to as the delegation ratio. The IDTSK (improved data transmission with secure key algorithm) methodology,

(1) Select a prime number "q" and its primitive root "a" $(I < = a < = q)$
(2) User 1:
Selects $\mathrm{pr}(1) = i - \mathrm{pu}(1) = a^i \mathrm{modq}$
(3) User 2:
Selects $\mathrm{pr}(2) = j - \mathrm{pu}(2) = a^j \mathrm{modq}$
(4) Both parties exchange public keys.
(5) User1:
(i) Shared secret key, $K = \mathrm{pu}(2)^{\mathrm{jr}(I)} = a^{\mathrm{ii}} \mathrm{modq}$
(6) User 2:
(ii) Shared secret key, $K = \mathrm{pu}(I)^{\mathrm{pv}(2)} = a^{\mathrm{ij}} \mathrm{modq}$

Algorithm 1: Pseudocode for the proposed algorithm.

Table 1: Confidentiality comparison values.

Delegation ratio (%)	IDTSK	IDHKE
0.1	25.2	27
0.2	38	41
0.3	44	46.8
0.4	58	62.5
0.5	69	72
0.6	78	79.8
0.7	80	83.4
0.8	87	89.6
0.9	96	98

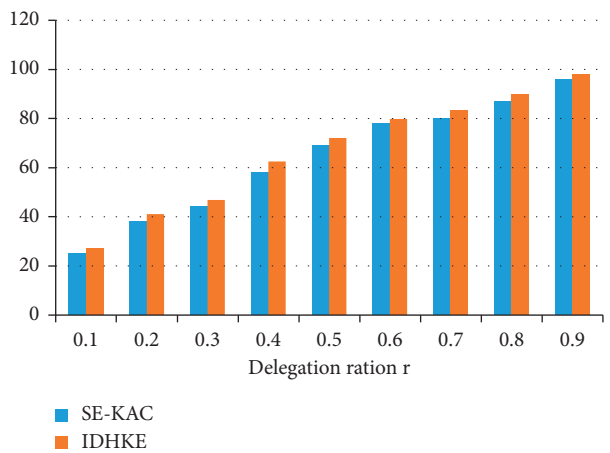

Figure 2: Confidentiality.

which was created previously, is known for its dual encryption mechanism with an identifier. In the suggested technique IDHKE, secure key sharing is implemented. The practical results prove methodology of IDHKE achieves maximum confidentiality against improved data transmission with secure key algorithm (IDTSK) techniques.

4.2. Integrity Comparison. Integrity values are analyzed among proposed IDHKE against existing methods, improved data transmission with secure key algorithm (IDTSK), which are tabulated in Table 2. In the scenario of delegation ratio 0.9, 97.2% integrity is attained in IDHKE.

Figure 3 shows the results of the current improved data transmission with the secure key algorithm (IDTSK) method compared to the proposed IDHKE technique in terms of structural integrity. Appendix indicates the pseudocode of the proposed work. The delegation ratio (represented by the X-axis) and the confidentiality (represented by the Y-axis) are shown on the graph. The delegation ratio refers to the proportion of delegated cipher text classes that are assigned to the classes in their entirety. Whenever it comes to data transmission, one of the most well-known methods is the improved data transmission with secure key algorithm (IDTSK). The suggested method IDHKE includes a secret key management system that is implemented. The practical findings demonstrate that the IDHKE approach delivers maximal integrity when compared to improved data transmission with secure key algorithm (IDTSK) methods.

4.3. User Satisfaction Degree. User satisfaction levels about cloud resources are referred to as Quality of Service to the user. Subjective and objective services are the two primary services provided to users by resources in which feedback information is required in the approach of subjective beginning users on completion of useful resource, and objective approach offers higher degrees of satisfaction among users' resource demand and the selected resources' capability. Figure 4 represents the user satisfaction.

Additionally, as shown in Figure 4, this section performs a comparative analysis of both proposed IDHKE and existing improved data transmission with secure key algorithm (IDTSK) approaches for parameter resource consumption rate as well as many other variables. When compared to the existing improved data transmission with secure key algorithm (IDTSK), IDHKE achieves a higher rate of resource utilization than the current improved data transmission with secure key algorithm (IDTSK). With rising resource consumption, the number of users increases from 50 to 300 because user tasks use more resources as a consequence of increased resource utilization. Rather than taking away a higher capacity resource from a user job with a lower priority, this arrangement enables more high capacity resources to be made available to users with higher demands. The upgraded Diffie–Hellman is compared to the traditional Diffie–Hellman in terms of time and memory consumption.

The proposed improved DH beats the existing conventional DH in terms of time consumption while dealing

Table 2: Integrity comparison values.

Delegation ratio (%)	Integrity (%)	
	Improved data transmission with secure key algorithm (IDTSK)	IDHKE
0.1	21.4	23.5
0.2	27.5	29
0.3	38.4	39
0.4	45.9	47
0.5	54.9	58
0.6	68.3	69.8
0.7	78.3	79.2
0.8	88.3	89.5
0.9	95.8	97.2

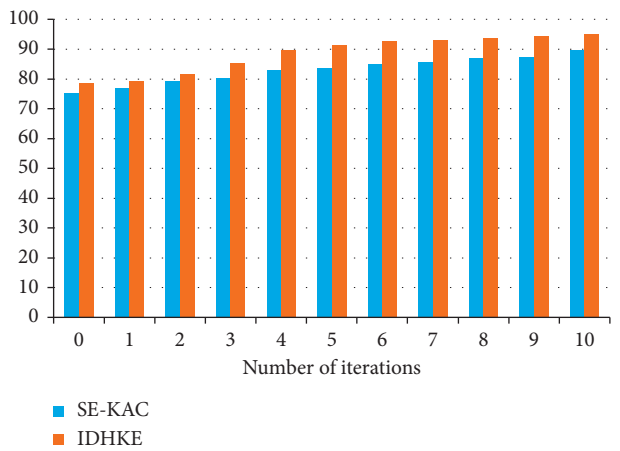

Figure 3: Integrity.

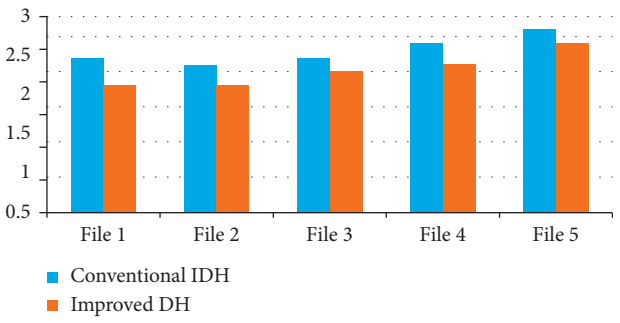

Figure 4: User satisfaction comparison.

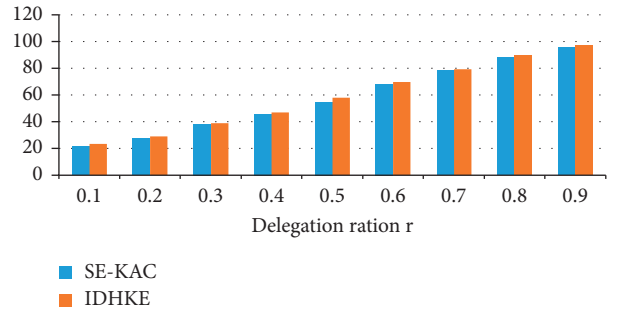

Figure 5: Time comparison between conventional DH and improved DH.

with files of variable length, as shown by the comparison given in Figure 5.

5. Conclusion

With the creation of the algorithm of improved Diffie–Hellman key exchange, it is hoped to optimise secret key exchange in a manner that is safe for data receivers while still preserving data security in the future. Because the secret key information must be sent in a secure way in order to preserve the greatest possible level of security. Using a master secret key and a random prime number for each parameter value makes it possible to establish a secure key generation process that is difficult to break. This enables accurate and reliable verification to be carried out during secure data transmission to be completed. Access control limitation is achieved via the use of attribute-based encryption, which is both secure and trustworthy. This platform, known as CloudSim, makes it easier to finish the research method, resulting in better findings than presently accessible techniques [39].

Appendix

Key expansion: the key expansion procedure divides a 448-bit key into multiple subkey arrays, resulting in a key with a total size of 4168 bytes when completed. Blowfish makes extensive use of subkeys to accomplish its goals. These keys will be produced in advance of any data encryption or decryption operations taking place.

The p-array is composed of 18 32-bit subkeys, which are denoted by the letters P1, P2, . . . , P18.

S1, 0, S1, 1, . . . , S1, 255 are four 32-bit S-Boxes with 256 elements each: S1, 0, S1, 1, . . . , S1.

S2, 0, S2, 1, . . . , S2, 255 are all numbers between 0 and 255.

S3, 0, S3, 1, . . . S3, 255 S4, 0, S4, 1, . . . S4, 255 S5, 0, S5, 1, . . . S5, 255 S6, 0, S6, 1, . . . S6, 255.

Divide the number x into two 32-bit halves, xL and xR. For I ranging from 1 to 16:

the product of XL and Pi is xL.

F(XL) XOR xR = F(XL) XOR xR.

Swap XL and xR.

XL and xR should be swapped (reverse the previous exchange), P17 = xR XOR xR XOR P17.

P18 = xL XOR xL XOR P18.

Combining xL and xR is recommended.

Data Availability

The data that support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they do not have any conflicts of interest.

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References

[1] T. Dillon, C. Wu, and E. Chang, "Cloud computing: issues and challenges," in *Proceedings of the 2010 24th IEEE international conference on advanced information networking and applications*, pp. 27–33, IEEE, NW Washington, DC, US, 20 April 2010.

[2] D. Zissis and D. Lekkas, "Addressing cloud computing security issues," *Future Generation Computer Systems*, vol. 28, no. 3, pp. 583–592, 2012.

[3] D. Jain, P. K. Shukla, and S. Varma, "Energy efficient architecture for mitigating the hot-spot problem in wireless sensor networks," *Journal of Ambient Intelligence and Humanized Computing*, 2022.

[4] P. Pateriya, R. Singhai, and P. Shukla, "Design and implementation of optimum LSD coded signal processing algorithm in the multiple-antenna system for the 5G wireless technology," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 7628814, 12 pages, 2022.

[5] E. M. Onyema, P. K. Shukla, S. Dalal, M. N. Mathur, M. Zakariah, and B. Tiwari, "Enhancement of patient facial recognition through deep learning algorithm: ConvNet," *Journal of Healthcare Engineering*, vol. 2021, Article ID 5196000, 8 pages, 2021.

[6] S. Pandit, P. K. Shukla, A. Tiwari, P. K. Shukla, M. Maheshwari, and R. Dubey, "Review of video compression techniques based on fractal transform function and swarm intelligence," *International Journal of Modern Physics B*, vol. 34, no. Number 08, pp. 2050–2061, 2020.

[7] A. Argyris, E. Pikasis, and D. Syvridis, "Gb/s one-time-pad data encryption with synchronized chaos-based true random bit generators," *Journal of Lightwave Technology*, vol. 34, no. 22, pp. 5325–5331, 2016.

[8] V. Bhandari, S. Tamrakar, P. Shukla, and A. Bhandari, "A new model of M-secure image via quantization," in *Data, Engineering and Applications*, R. K. Shukla, J. Agrawal, S. Sharma, and G. Singh Tomer, Eds., Springer, Singapore, 2019.

[9] S. Stalin, V. Roy, P. K. Shukla et al., "A machine learning-based big EEG data artifact detection and wavelet-based removal: an empirical approach," *Mathematical Problems in Engineering*, vol. 2021, Article ID 2942808, 11 pages, 2021.

[10] A. Revathi, R. Kaladevi, R. H. J. Kadiyala Ramana, and M. S. P. K. Madapuri Rudra Kumar, "Early detection of cognitive decline using machine learning algorithm and cognitive ability test," *Security and Communication Networks*, vol. 2022, Article ID 4190023, 13 pages, 2022.

[11] L. Xu, X. Zhou, X. Li, R. H. Jhaveri, T. R. Gadekallu, and Y. Ding, "Mobile collaborative secrecy performance prediction for artificial IoT networks," *IEEE Transactions on Industrial Informatics*, p. 1, 2021.

[12] R. Panigrahi, S. Borah, A. K. Bhoi et al., "A consolidated decision tree-based intrusion detection system for binary and multiclass imbalanced datasets," *Mathematics*, vol. 9, no. 7, p. 751, 2021.

[13] R. Bhatt, P. Maheshwary, and P. Shukla, "Application of fruit fly optimization algorithm for single-path routing in wireless sensor network for node capture attack," in *Computing and Network Sustainability*, SL. Peng, N. Dey, and M. Bundele, Eds., vol. 75, Singapore, Springer, 2019.

[14] A. Khare, R. Gupta, and P. K. Shukla, "Improving the protection of wireless sensor network using a black hole optimization algorithm (BHOA) on best feasible node capture attack," in *IoT and Analytics for Sensor Networks*, P. Nayak, S. Pal, and SL. Peng, Eds., vol. 244, Singapore, Springer, 2022.

[15] P. Bondada, D. Samanta, M. Kaur, and H.-N. Lee, "Data security-based routing in MANETs using key management mechanism," *Applied Sciences*, vol. 12, no. 3, p. 1041, 2022.

[16] R. R. Althar, D. Samanta, M. Kaur, A. A. Alnuaim, N. Aljaffan, and M. Aman Ullah, "Software systems security vulnerabilities management by exploring the capabilities of language models using NLP," *Computational Intelligence and Neuroscience*, vol. 2021, Article ID 8522839, 19 pages, 2021.

[17] M. Arif and F. Ajesh, "Shermin shamsudheen, oana geman, diana izdrui, dragos vicoveanu, "brain tumor detection and classification by MRI using biologically inspired orthogonal wavelet transform and deep learning techniques," *Journal of Healthcare Engineering*, vol. 2022, Article ID 2693621, 18 pages, 2022.

[18] J. Amin, M. Sharif, A. Haldorai, and R. S. Nayak, "Brain tumor detection and classification using machine learning: a comprehensive survey," *Complex Intell. Syst.*, 2021.

[19] T.-Q. Lan, D. Wei, S.-T. Yang, and X. Liu, "Enhanced cellulase production by Trichoderma viride in a rotating fibrous bed bioreactor," *Bioresource Technology*, vol. 133, pp. 175–182, 2013.

[20] H. Kaushik, D. Singh, M. Kaur, H. Alshazly, A. Zaguia, and H. Hamam, "Diabetic retinopathy diagnosis from fundus images using stacked generalization of deep models," *IEEE Access*, vol. 9, pp. 108276–108292, 2021.

[21] H. Y. Lin, "Wen-GueyTzeng,"A secure erasure code-based," *Cloud StorageSystem with Secure Data Forwarding" Vol*, vol. 23, no. 6, 2012.

[22] M. Y. Tseng, J. C. Lin, T. Y. Huang et al., "Endoscopic submucosal dissection for early colorectal neoplasms: clinical experience in a tertiary medical center in taiwan," *Gastroenterology research and practice*, vol. 2013, pp. 891565–7, Article ID 891565, 2013.

[23] D. Singh, V. Kumar, M. Kaur, M. Y. Jabarulla, and H.-N. Lee, "Screening of COVID-19 suspected subjects using multi-crossover genetic algorithm based dense convolutional neural network," *IEEE Access*, vol. 9, pp. 142566–142580, 2021.

[24] H. Wang and Y. Zhang, "On the knowledge soundness of a cooperative provable data possession scheme in multicloud storage," *IEEE Transactions on Parallel and Distributed Systems*, vol. 25, no. 1, pp. 264–267, 2013.

[25] A. Kumar, M. Saini, N. Gupta et al., "Efficient stochastic model for operational availability optimization of cooling tower using metaheuristic algorithms," *IEEE Access*, vol. 10, pp. 24659–24677, 2022.
[26] J. Hur, "Attribute-based secure data sharing with hidden policies in smart grid," *IEEE Transactions on Parallel and Distributed Systems*, vol. 24, no. 11, pp. 2171–2180, 2013.
[27] R. Gopinath and B. G. Geetha, "An e-learning system based on secure data storage services in cloud computing," *International Journal of Information Technology and Web Engineering*, vol. 8, no. 2, pp. 1–17, 2013.
[28] G. Khambra and P. Shukla, "Novel machine learning applications on fly ash based concrete: an overview," *Materials Today Proceedings*, 2021.
[29] N. K. Rathore, N. K. Jain, P. K. Shukla, U. Rawat, and R. Dubey, "Image forgery detection using singular value decomposition with some attacks," *National Academy Science Letters*, vol. 44, no. 4, pp. 331–338, 2021.
[30] M. Gupta, V. P. Singh, K. K. Gupta, and P. K. Shukla, "An efficient image encryption technique based on two-level security for internet of things," *Multimedia Tools and Applications*, 2022.
[31] I. Waddington and A. Smith, *Sport, Health and Drugs: A Critical Sociological Perspective*, Routledge, 2013.
[32] A. Mohamed Shabbir Hamza, *A Secure Approach for Health Information Exchange Using mobile Personal Health records/ Mohamed Shabbir Hamza Abdulnabi*, Doctoral dissertation, University of Malaya, Malaysia, 2018.
[33] J. P. Lees, V. Poireau, V. Tisserand et al., "Search for a Dark Photon in e+ e− Collisions at B a B ar," *Physical Review Letters*, vol. 113, no. 20, Article ID 201801, 2014.
[34] P. Kumar, S. Kumari, V. Sharma, A. K. Sangaiah, J. Wei, and X. Li, "A certificateless aggregate signature scheme for healthcare wireless sensor network," *Sustainable Computing: Informatics and Systems*, vol. 18, pp. 80–89, 2018.
[35] C. Ozkan and K. Bicakci, "Security analysis of mobile authenticator applications," in *Proceedings of the 2020 International Conference on Information Security and Cryptology (ISCTURKEY)*, pp. 18–30, IEEE, Ankara, Turkey, 3 December 2020.
[36] S. Gadde and P. N. Singh, "Enhance data security protection for data sharing in cloud storage system," *International Journal on Future Revolution in Computer Science & Communication Engineering*, vol. 3, no. 11, pp. 447–450, 2017.
[37] R. Hentschel, C. Leyh, and A. Petznick, "Current cloud challenges in Germany: the perspective of cloud service providers," *Journal of Cloud Computing*, vol. 7, no. 1, pp. 1–12, 2018.
[38] Q. Wang, K. Ren, S. Yu, and W. Lou, "Dependable and secure sensor data storage with dynamic integrity assurance," *ACM Transactions on Sensor Networks*, vol. 8, no. 1, pp. 1–24, 2011.
[39] P. Kumar Shukla, P. Kumar Shukla, P. Sharma et al., "Efficient prediction of drug-drug interaction using deep learning models," *IET Systems Biology*, vol. 14, no. 4, pp. 211–216, 2020 Aug.

A Real-time Implementation for the Speech Steganography using Short-Time Fourier Transformior Secured Mobile Communication

A Real-time Implementation for the Speech Steganography using Short-Time Fourier Transformfor Secured Mobile Communication

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Abstract. Steganography can be described as approach of masking an undisclosed message with a normal message which is known as the Carrier message signal. DSP techniques, such as LSB encoding, have historically been implemented for secret information hiding. Utilization ofsteganography functions of deep neural networks for voice data is something this paper will present. This paper also demonstrate that the steganography techniques suggested for vision are less suitable for speech signals this paper present a implementation technique that involves the use of ISTFT and STFT as differentiablelayers in the network. Empirically, the efficacy of the proposed methods based on multiple datasets of speech should be demonstrated and the outcome are examined quantitatively and qualitatively. Using of multiple decoders or a single conditional decoder helps to hide multiple signals in a single carrier signal. Finally, under various channel distortion situations, this model Qualitative studies indicate that human listeners cannot detect changes made to the carrier and hence the decoded messages are highly intelligible.
Index Terms—Speech Steganography, Digital Signal Process, Fourier Transform, STFT

1. Introduction

Steganography can be described as an approach of masking an undisclosed message with normal public message which is known as the Carrier data. It is described as digital steganography when we implement these techniques over the digital data signals [1,2]. Cover objectswe use for steganography may vary, for example steganography algorithms for image based data are widely developed, however the steganography algorithms or steganography techniques for audio signals are relatively very less in number.

Implementation of steganography to the audio archive is not as simplewhen compared with implementing steganography to image archive, in general the raw sound data files are larger when

compared to the raw image data, the raw image file with 1280x800resolution, hasapproximately 3MB data for a 24 bit colour image file has. While the raw audio files with:

1. Sampling frequency 44.1 KHZ,
2. 16 bit stereo channels
3. 4-minute duration has a size of 40 MB approximately.

The variation between both the image and audio is very large, hence the use of steganography techniques in audio data becomes difficult when compared to image signals. WhenDiscrete Fourier Transform is used for data domain conversion, then the audio data files require more cost as number of samples that require transformation are much more when compared to image signals. When we implement the LSB Method the noise generated at the sound file is very high. 24 bits are used to encode the Pixel, however only 15 bits are required for encoding the sound signal, the usage of the raw audio files is low when compared to the image files because of large size, hencewe should implement such a technique need that allow us to save the secret messages, even after compressing the audio data. Modern steganography technique includes the techniques for hiding data into digital files in network level in the packets that get transmitted [3,4]. The following elements are required to hide the information into media files.

- C - Cover media or a masking signal to hide the secret data
- M - Hidden message.
- Fe – Stego function and inverse stego function Fe^{-1}which are used to hide and unhide the information.
- K – an optional stego key to hide and unhide the message

Stegofunction operates on the cover media or the masking signal and the message to be hidden along with thestegokey to produce the stegomedia S.

The outline of a stenographic operation is shown below.

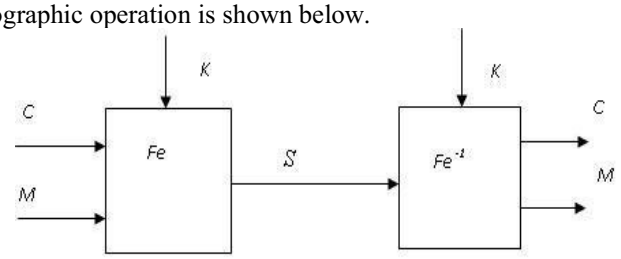

Fig. 1. The Stenographic Process

Steganography with cryptography is considered as perfect combination for information security.

Modern techniques of steganography

The modern techniques in steganography include exploitation of media file to convey the message. Media that are widely used for embedding message digitally.

- Plain text
- Images
- Audio and Video
- IP datagram

Proposal for usage of deep neural networks as a stenographic function[1,2] to hide the image inside other image, unlike the traditional steganography techniques [3,4], in the proposed technique network try to retrieve the secret data hidden in the cover signal with no manual specification of the specific check of redundancy , the aboveoutcomes present acceptableoutcomes on the image data, however the implementation of such models on speech data is not highly developed due limitations like size of the data and noise in the audio data.

In comparison to dealing with raw image files in the vision processing in time domain,The most commonly implemnted approach when understanding speech data in frequency domain is to use STFT and then monitor the spectral changes over period of time.The output of the STFT is the complex matrix of the FT at distincttime intervals, the most commonly used approach is to use absolute value or magnitudevalue of Short Time Fourier Transform measurement, and maintain a acceptable

overlapping in between adjacent intervals of time[5].This approach also further complicates the restoration of signal in time domain.This paper proves that steganography techniques implemented for vision are less suitable when implemented with voice data. We and propose a new method which include implementing STFT and ISTFT as differentiable layers in the network[6,7].
The process of hiding the written text in the audio file is easy when compared to the hiding the audio signal inside the audio file, and this requires many other additional features, for examplelet the hidden information may reveal the identity of the speaker, speaker sentimental state, etc. These features later used for identification and authentication of message. Similarly, [8,9] the proposed model contain three verticals, first vertical is to learn how to encode the hidden data or data in the carrier signal, nextvertical is DSTFT and ISTFT layers that simulate transformations between time domain and frequency domain. Third vertical is to learn decoding the hidden message from a generated carrier [10,11], in addition we demonstrated how the above method allow us to use single carrier signal to hide multiple secret messages, each with a intended recipient who is authorised to retrieve the message [12,13]. Further analysis proves including of layers in STFT produce a highly sophisticated method which is highly efficient for various distortions and compressions techniques, which include MP3 encoding, AWGN,. Qualitative analysis suggests that modification to carrier is unpredictable by human andthe messages decoded preserve other important semantic content like speaker identity [14,15].

2. Methodology

A. STFT

Only a small variation exists in STFT and Fourier Transform. Sampling is done on the signal to divide the signal into small enough portions, these signal portions are assumed to be stationary,"W" is the function of window that is chosen in such a way thewindow function width is equal to the signal partition where signal is stationary[16,17].At t=0, i.e., at the initial position of the signal "W" a window function is located, let us assume that at the t=0 the window function width be "T" s, with initial T/2 seconds the W will overlap [18]. Then the signalis multiplied with window function, only initial T/2 seconds of the signal is chosen, with appropriate window weighting, then the resultant product is just other signal, whose Fourier transform is to be considered [19,20]. The transformation result is the FT of the initial T/2 seconds of given signal., then there will be no problem If this portion of the signal is constantand the result generatedis true frequency representation of the initial T/2 seconds of the signal. The next step would bescaling this window function to a new position then multiply this with the signal and take FT of the product. By performing the shifting operation on the window with "t1" second interval this is repeated until the end of the signal.

$$STFT_X^{(w)}(t', f) = \int [x(t) * \omega^*(t - t'] * e^{-j2\pi ft} dt \quad (4)$$

We can understand from the previous equation, that the term x(t) is the representation of the signal, the term w(t) represent the window function which is used, and finally * is the complex conjugate.
For every t' and f, the signal's FT is multiplied with the signal's window function STFT, as shown in the previous equation. New STFT coefficient is computed better:

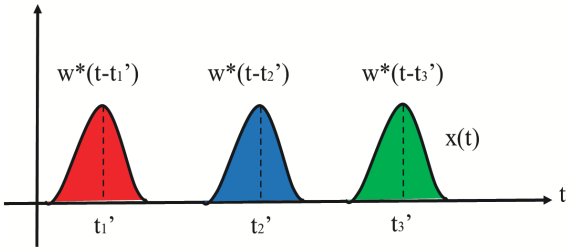

Fig.2. Spectra of Short Time Fourier transform

Windowing functions are the Gaussian like function as shown in the Fig 2 with different colours as:

- The red one represents the window at t = t_1' location
- Blue colour represents the window at t=t_2' location
- Green one shows the window at t=t_3' location,

These are three different Fourier Transforms at three different time intervals, so a true time frequency representation(TFR) of the signal is obtained. the transform will be two dimensionalSince our transform is a function of both frequency and time consider a non-stationary signal, shown in fig3.

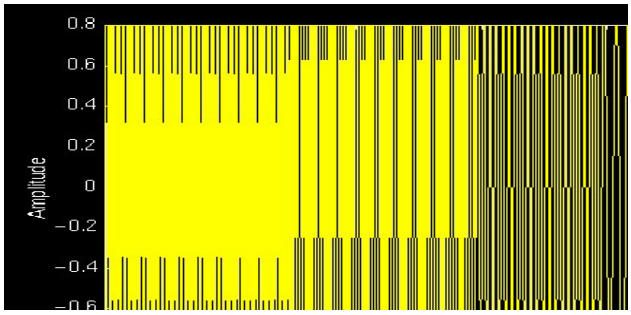

Fig.3. Non stationary signal

The above signal comprises four components of frequency at different intervals of time,
The interval between 0 and 250 ms is a basic sinusoid signal of 300 Hz, • the other 250 ms intervals are sinusoid signals of 200 Hz, 100 Hz, and 50 Hz, respectively. Let's take a look at this non-stationary signal,STFT.[21,22].

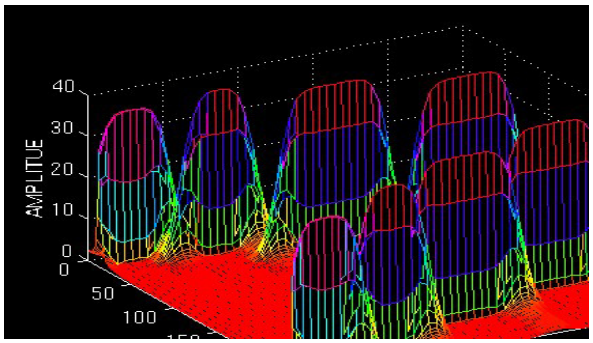

Fig. 4. STFT Non stationary signal

This is a plot of two dimensions. The 'x' axes — as planned — reflect time.
The axes on the 'y' axis reflect frequency. Note that with respect to centre of the 'y' axis which is frequency axisthe graph is symmetric. Though it was not shown Symmetric form always represent the FourierTransform of a real signal as it is knon that windowing FT will generate STFT, so we can conclude that STFT is also frequency symmetric. Negative frequencies represent The symmetric part, which is difficult to comprehend, fortunately it can be avoided as it is not important, hence, we can conclude that both Short TimeFourierTransform and Fourier Transform are symmetric. We can observe that to four different frequency componentsthere are four peaks corresponding, each peak is separated by a time interval.Unlike FT, thereal signal had four components of spectrum situated at various time intervals. You may wonder why we need the wavelet transformation, TFR of the signal is given by STFT, the STFT's implicit problem is not apparent. In the case above. To explain the concept[23,24],
It's impossible to say what spectral components are present at any given time. In a nutshell, the signal's precise time-frequency representation is unknown, i.e. we can only obtain the intervals of time during which a specific band of frequencies exists, which is aissue of resolution. [25,26].

the window function width is some way related to STFT function. The window width element is selected as the window's support. It is compactly supported when the narrow window feature is present, this often used in wavelet world.

In the frequency domain, we remember that there is no resolution problem in FT, That is to say, we have precise knowledge of the frequencies that exist. In the same way, in time domain there is no time resolution problem as we have at every instant we have information about the signal's value. In contrast, we can deduce that the Fourier Transform's time resolution and frequency resolutions in the time domain are both zero because no information related to them is available. The window used in the FT is its kernel this is the fact that gives the perfect frequency resolution in FT , the exp{jwt} range is from + infinity to - infinity, there is a function that lasts at all times. ShortTimeFourierTransform's window function is finite in duration and only covers a part of the signal, reducing frequency domain resolution. That is, we no longer have the knowledge of exact frequencies of the signal's frequency components, but we do know the frequency band in which they reside.

Because the kernel function in FT has an infinite duration window, it aids in obtaining an accurate frequency resolution. Because the STFT window is finite in size, Perfect frequency resolution is no longer possible. Why don't we make the STFT window length infinite to achieve perfect frequency resolution? just like the FT? In that case, we may All time information is lost, and the FT is used instead of the STFT. To put it another way, we're faced with the following conundrum:

We get the FT when we use an infinite length window, which

provides complete frequency resolution with out information about time.. We will need a window which is almost short enough in which the signal is constant toachieve stationarity. [27,28]. The smaller the window, better the resolution of time and presumption of stationarity; hence, the frequency resolution suffers. [29] when comparing a narrow and a wide window The time resolution of a narrow window is excellent, but the frequency resolution is poor, and the frequency resolution of a wide window is good but the time resolution is poor.

3. Simulation Results

We used MATLAB to run all of the simulations, and we used a variety of audio samples to test both current and proposed methods with different cr values. Figure 5 shows audio steganography based on STFT, in which the stegoaudio differs from the original audio, indicating that the unauthorised entity does not have a choice. Figure 5 shows the difference between original and stegoaudio, which results in a highly secure system. We can see that both original and stegoaudio appear to be identical, which is achieved by our proposed STFT approach. and retrieved signal in figure 6.

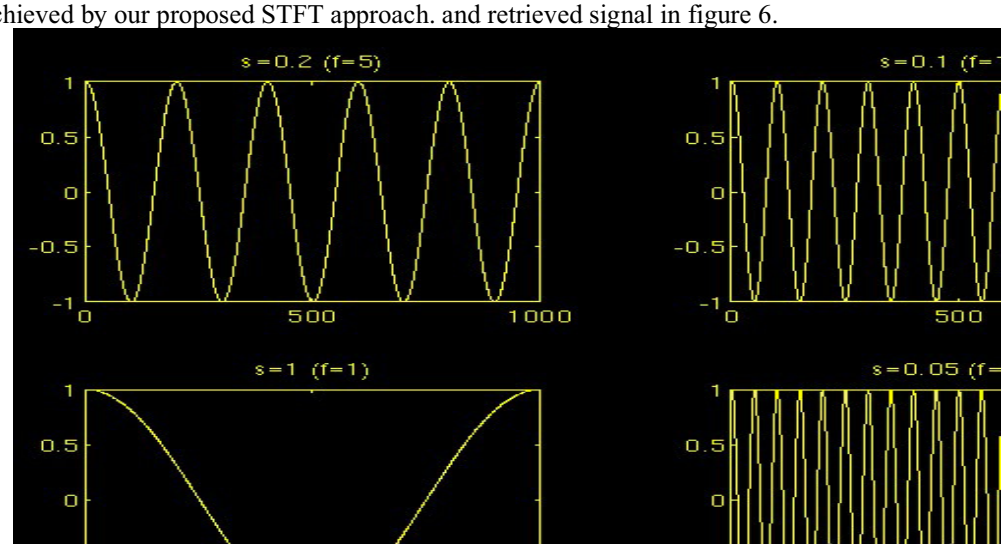

Fig.5. STWT Steganography signal

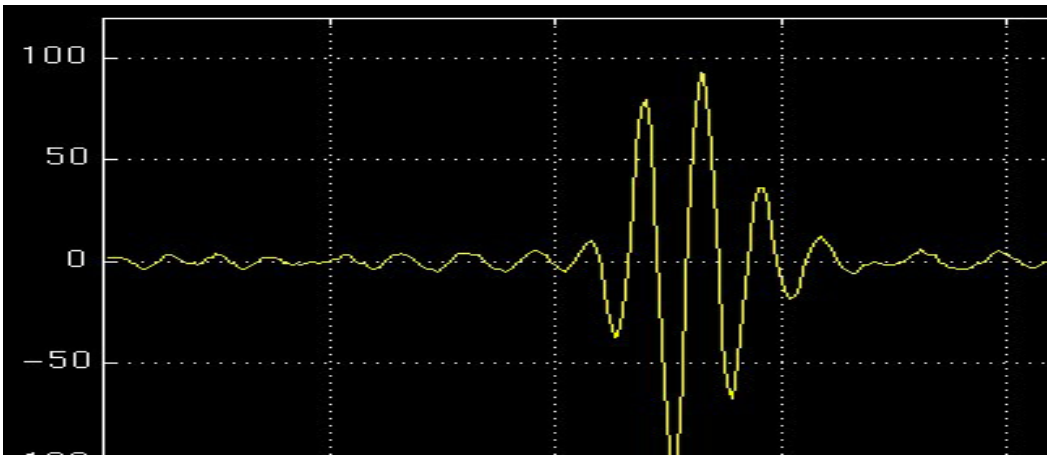

Fig. 6. Retrieved Steganography signal

4. Conclusion

It has been concluded that that the suggested speech steganography produced the superior results. The proposed method proved to be resistant to audio manipulation and very secure, with very little noise as a result. The most important feature of this technique is that it reduces the number of computations needed and does not require the use of complex equations, making it simple and straightforward to use in real time situations

References

[1] ShumeetBaluja, "Hiding images in plain sight: Deep steganography," in Advances in Neural Information Processing Systems, 2017. 2069–2079.
[2] Jiren Zhu, Russell Kaplan, Justin Johnson, and Li Fei-Fei, "Hidden: Hiding data with deep networks," in European Conference on Computer Vision. Springer, 2018. 682–697.
[3] TayanaMorkel, Jan HP Eloff, and Martin S Olivier, "An overview of image steganography.," in ISSA, 2005, pp. 1–11.
[4] GC Kessler, "An overview of steganography for the computer forensics examiner. retrieved february 26, 2006," 2004.
[5] Jae Soo Lim and Alan V Oppenheim, "Enhancement and bandwidth compression of noisy speech," Proceedings of the IEEE, vol. 67, no. 12, pp. 1586–1604, 1979.
[6] Kishore Jaganathan, Yonina C Eldar, and BabakHassibi, "Stft phase retrieval: Uniqueness guarantees and recovery algorithms," IEEE Journal of selected topics in signal processing, vol. 10, no. 4, pp. 770–781, 2016.
[7] E Hofstetter, "Construction of time-limited functions with specified autocorrelation functions," IEEE Transactions on Information Theory, vol. 10, no. 2, pp. 119–126, 1964.
[8] Daniel Griffin and Jae Lim, "Signal estimation from modified short-time fourier transform," IEEE Transactions on Acoustics, Speech, and Signal Processing, vol. 32, no. 2, pp. 236–243, 1984.
[9] John S Garofolo, Lori F Lamel, William M Fisher, Jonathan G Fiscus, and David S Pallett, "Darpatimit acoustic-phonetic continous speech corpus cd-rom. nist speech disc 1-1.1," NASA STI/Recon technical report n, vol. 93, 1993.
[10] Joseph P Campbell, "Testing with the yohocd-rom voice verification corpus," in ICASSP, 1995.
[11] Yann N Dauphin, Angela Fan, Michael Auli, and David Grangier, "Language modeling with gated convolutional networks," in Proceedings of the 34th International Conference on Machine Learning-Volume 70. JMLR. org, 2017, pp. 933–941.

[12] Georg Heigold, Ignacio Moreno, SamyBengio, and Noam Shazeer, "End-to-end text-dependent speaker verification," in 2016 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). IEEE, 2016, pp. 5115–5119.
[13] P Jayaram, HR Ranganatha, and HS Anupama, "Information hiding using audio steganography–a survey," The International Journal of Multimedia & Its Applications (IJMA) Vol, vol. 3, pp. 86–96, 2011.
[14] Xiaoxiao Dong, Mark F Bocko, and ZeljkoIgnjatovic, "Data hiding via phase manipulation of audio signals," in Acoustics, Speech, and Signal Processing, 2004. Proceedings.(ICASSP'04). IEEE International Conference on. IEEE, 2004, vol. 5, pp. V–377.
[15] Walter Bender, Daniel Gruhl, and Norishige Morimoto, "Method and apparatus for echo data hiding in audio signals," Apr. 6 1999, US Patent 5,893,067.
[16] Jamie Hayes and George Danezis, "Generating steganographic images via adversarial training," in Advances in Neural Information Processing Systems, 2017, pp. 1954–1963.
[17] Yinlong Qian, Jing Dong, Wei Wang, and Tieniu Tan, "Deep learning for steganalysis via convolutional neural networks," in Media Watermarking, Security, and Forensics 2015. International Society for Optics and Photonics, 2015, vol. 9409, p. 94090J.
[18] [18] Lionel Pibre, JérômePasquet, Dino Ienco, and Marc Chaumont, "Deep learning is a good steganalysis tool when embedding key is reused for different images, even if there is a cover sourcemismatch," Electronic Imaging, vol. 2016, no. 8, pp. 1–11, 2016.
[19] Pin Wu, Yang Yang, and Xiaoqiang Li, "Stegnet: Mega image steganography capacity with deep convolutional network," Future Internet, vol. 10, no. 6, pp. 54, 2018.
[20] Weixuan Tang, Shunquan Tan, Bin Li, and Jiwu Huang, "Automatic steganographic distortion learning using a generative adversarial network," IEEE Signal Processing Letters, vol. 24, no. 10, pp. 1547–1551, 2017.
[21] Nameer N El-emam, "Embedding a large amount of information using high secure neural based steganography algorithm," International Journal of Information and Communication Engineering, vol. 4, no. 2, pp. 2, 2008.
[22] Haichao Shi, Jing Dong, Wei Wang, Yinlong Qian, and Xiaoyu Zhang, "Ssgan: secure steganography based on generative adversarial networks," in Pacific Rim Conference on Multimedia. Springer, 2017, pp. 534–544.
[23] Wenxue Cui, Shaohui Liu, Feng Jiang, Yongliang Liu, and Debin Zhao, "Multi-stage residual hiding for image-into-audio steganography," in ICASSP 2020-2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). IEEE, 2020, pp. 2832–2836.
[24] Shivam Agarwal and SiddarthVenkatraman, "Deep residual neural networks for image in speech steganography," arXiv preprint arXiv:2003.13217, 2020.
[25] Ru Zhang, Shiqi Dong, and Jianyi Liu, "Invisible steganography via generative adversarial networks," Multimedia tools and applications, vol. 78, no. 7, pp. 8559–8575, 2019.
[26] Ron G Van Schyndel, Andrew Z Tirkel, and Charles F Osborne, "A digital watermark," in Image Processing, 1994. Proceedings. ICIP-94., IEEE International Conference. IEEE, 1994, vol. 2, pp. 86–90.
[27] Raymond B Wolfgang and Edward J Delp, "A watermark for digital images.," in ICIP (3), 1996, pp. 219–222.
[28] Yusuke Uchida, Yuki Nagai, Shigeyuki Sakazawa, and Shin'ichi Satoh, "Embedding watermarks into deep neural networks," in Proceedings of the 2017 ACM on International Conference on Multimedia Retrieval. ACM, 2017, pp. 269–277.
[29] Yossi Adi, Carsten Baum, MoustaphaCisse, Benny Pinkas, and Joseph Keshet, "Turning your weakness into a strength: Watermarking deep neural networks by backdooring," USENIX, 2018.

Various OLAP Technologies and their Impact on Decision Making

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Abstract: This paper provides an outline of knowledge repositing, OLAP, OLTP technologies, exploring the options, applications and therefore the design of knowledge repositing. the information warehouse supports on-line analytical process (OLAP), the practical and performance needs of that area unit quite totally different from those of the on-line dealing process (OLTP) applications historically supported by the operational databases. knowledge warehouses give on-line analytical process (OLAP) tools for the interactive analysis of two-dimensional knowledge of assorted granularities, that facilitates effective data processing. knowledge repositing and on-line analytical process (OLAP) area unit essential parts of call support, that has more and more become a spotlight of the info business. OLTP is customer-oriented and is employed for dealing and question process by clerks, purchasers and knowledge technology professionals. Associate in Nursing OLAP system is market-oriented and is employed for knowledge analysis by data staff, together with managers, executives and analysts. knowledge repositing and OLAP have emerged as leading technologies that facilitate knowledge storage, organization so, vital retrieval. call support places some rather totally different needs on info technology compared to ancient on-line dealing process applications.

1. Introduction

Decision support systems (DSS) are pc technology solutions which will be accustomed support advanced deciding and drawback determination. DSS have evolved from 2 main areas of research—the theoretical studies of structure deciding (Simon, Cyert, March, and others) conducted at the Carnegie Institute of Technology throughout the late Nineteen Fifties and early Sixties and therefore the technical work (Gerrity, Ness, and others) allotted at university within the Sixties [1]. Classic DSS tool style is comprised of elements for (i) refined direction capabilities with access to internal and external information, data, and information, (ii) powerful modeling functions accessed by a model management system, and (iii) powerful, nevertheless easy computer program styles that allows interactive queries ,reporting and graphing functions. Where: OLAP = on-line processing, CRM=customer relationship management, DSS= call support systems, GIS = geographic data systems the rest of this paper is organized because the 2d section presents development of the DSS thought. third section contains information management and call support systems. fourth section contains OLAP in information warehouse. The fifth section concludes and future analysis direction.

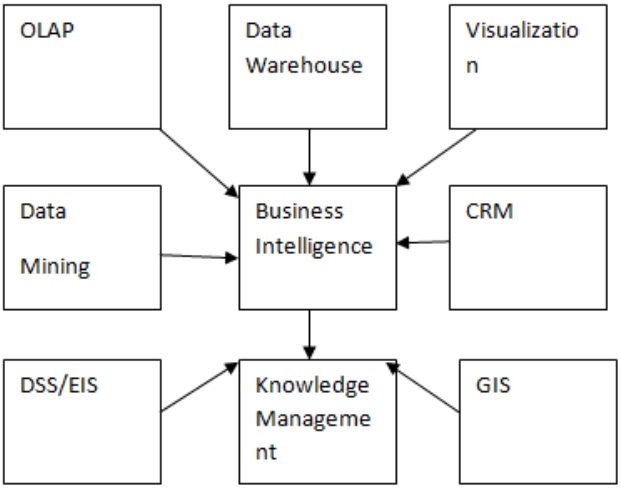

Fig. 1- BI Relation to Other Information Systems.

2. Development of the DSS Concept

The original DSS construct was most clearly outlined by Gorry and Scott Ferdinand Joseph La Menthe Morton [2], World Health Organization integrated Anthony's [3] classes of management activity and Simon's [4] description of call sorts. Anthony represented management activities as consisting of strategic coming up with (executive selections relating to overall mission and goals), internal control (middle management guiding the organization to goals), and operational management (first line supervisors leading specific tasks). Simon represented call issues as existing on a time from programmed (routine, repetitive, well structured, simply solved) to non-programmed (new, novel, ill-structured, tough to solve). Gorry and Scott Ferdinand Joseph La Menthe Morton combined Anthony's management activities and Simon's description of selections, mistreatment the terms structured, unstructured, and semi-structured, instead of programmed and nonprogrammed. They conjointly used Simon's Intelligence, Design, and selection description of the decision-making method. during this framework, intelligence is comprised of the seek for issues, style involves the event of alter- natives, and selection consists of analyzing the alternatives and selecting one for implementation. A DSS was outlined as a system that handled a retardant wherever a minimum of some stage was semi-structured or unstructured. A system may well be developed to cope with the structured portion of a DSS downside, however the judgment of the decision-maker was delivered to bear on the unstructured half, therefore constituting a personality's – machine, problem-solving system.

3. Knowledge Management and Decision Support Systems

KNOWLEDGE MANAGEMENT (KM) refers to the set of business processes developed in a company to make, store, transfer and apply data. kilometre will increase the flexibility of the organization to find out from its setting and to include data into business processes. There area unit 3 major classes of KMS: enterprise-wide KMS, data work systems (KWS), and intelligent techniques [4,5]. DSS mix knowledge, refined analytical models and tools, and easy software package into a single powerful system that will support semistructured and unstructured call creating [5, 6, 7]. The main parts of the DSS area unit the DSS information, the user interface, and the DSS code (Figure 1). The DSS information could be a assortment of current knowledge from a range of applications and teams. as an alternative, the DSS information could be a knowledge warehouse that integrates the enterprise knowledge sources and maintains historical knowledge. The DSS computer program permits straightforward interactions between users of the system and the DSS software package tools. several DSS these days have internet interfaces to require benefits of graphics displays, interactivity, and easy use. The DSS code contains the software package tools that area unit used for knowledge analysis. It could contain numerous OLAP tools, knowledge mining tools, or a set of mathematical and analytical models that simply is created accessible to the DSS users.

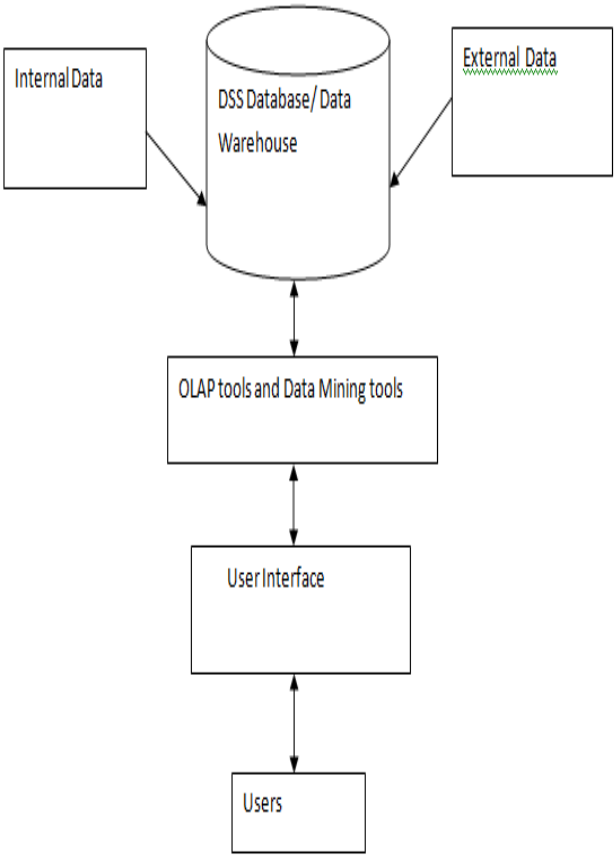

Fig. 2- Main Components of the DSS

3.1. Technological and Organizational Aspect of the BI Systems

Technological aspect of the BI systems primarily involves methods of knowledge creation, sources of knowledge and information technology tools. Case Base Reasoning (CBR) provides for solving of new problems by means of adopting solutions that have been previously applied to solve similar problems [8,9]. CBR consists of the following two stages:

- Remembering current experiences and cases (in the memory of a human being or computer).
- Solving a new problem- (a) retrieving similar experiences and situations from the memory. (b) reusing given experience in the context of a new problem: complete or partial utilization or

revisiting for a new problem. (c) retaining new experiences in the memory (learning).

Such approach may definitely be applied in the BI due to its advantages including:

- reduction of much effort related with knowledge acquisition,
- decrease in effort necessary to retain knowledge,
- perfecting, improving and enhancing of a problem-solving process by means of re-utilisation of experience,
- taking advantage of already gathered and analysed data,
- rapid adoption of experience to a particular problem.

Event sequence analysis is a useful approach to collect and create knowledge in the BI. According to the principles of this method it is possible to collect a sequence of events that provide a complete description of key processes in an organization.[10,11,12].

4. OLAP in Data Warehouse

[Witten, Ian H. and Frank, Eibe, 2000] merely told, data} warehouse stores plan of action information that answers "who?" and "what?" questions about past events. whereas OLAP systems have the power to answer "who?" and "what?" queries, it's their ability to answer "what if?" and "why?" that sets them aside from knowledge warehouses.

- OLAP allows higher cognitive process regarding future actions. In distinction to knowledge warehouse, this is often sometimes supported relative technology. OLAP uses a three-dimensional read of mixture knowledge to supply fast access to strategic data for additional analysis.
- OLAP and knowledge warehouses area unit complementary. {a knowledge|a knowledge|an information} warehouse manages and stores data. OLAP transforms knowledge warehouse "data" into "strategic information". It ranges from basic navigation and browsing (often referred to as 'slice and dice') to calculations, to additional serious analysis like statistic and complicated modeling.

5. Conclusion

In this paper, we have a tendency to conferred an summary of information deposition, data processing, OLAP, OLTP technologies, exploring the options, applications and also the design of information deposition. the info warehouse supports on-line analytical process (OLAP), the useful and performance needs of that are quite totally different from those of the on-line group action process (OLTP) applications historically supported by the operational databases. knowledge warehouses give on-line analytical process (OLAP) tools for the interactive analysis of two-dimensional knowledge of various granularities, that facilitates effective data processing. knowledge deposition and on-line analytical process (OLAP) are essential parts of call support, that has more and more become a spotlight of the info business. knowledge warehouse may be aforesaid to be a semantically consistent knowledge store that is a physical implementation of a choice support knowledge model associated stores the data on that an enterprise must create strategic choices. So, its design is alleged to be created by desegregation knowledge from multiple heterogeneous sources to support and /or adhoc queries, analytical coverage and decision-making [14-18]. knowledge warehouses give on-line analytical process (OLAP) tools for the interactive analysis of two-dimensional knowledge of various granularities, that facilitates effective data processing. knowledge deposition and on-line analytical process (OLAP) are essential parts of call support, that has more and more become a spotlight of the info business. OLTP is customer-oriented and is employed for group action and question process by clerks, purchasers and knowledge technology professionals. the duty of earlier on-line operational systems was to perform group action and question process. knowledge warehouse systems serve users or information staff within the role of information analysis and decision-making. Such systems will and gift knowledge in numerous formats so as to accommodate the varied desires of the various users. OLAP applications are found within the space of monetary modeling (budgeting, planning), sales foretelling, client and merchandise profit, exception coverage, resource allocation, variance analysis, promotion designing, and market share analysis. Moreover, OLAP permits managers to model issues that may be not possible victimization less versatile systems with drawn-out and inconsistent response times. additional management and timely access to strategic data facilitates effective call -making. This provides leverage to library managers by providing the flexibility to model world projections and a additional economical use of resources. OLAP permits the organization as a full to reply additional quickly to plug demands. Market responsiveness, in turn, usually yields improved revenue and profit. And there's no got to emphasize that gift libraries got to give market-oriented services.

REFERENCES

[1] P. Keen, M. Scott Morton, Decision Support Systems: An Organizational Perspective, Addison-Wesley Publishing, 1978.

[2] G.A. Gorry, M.S. Scott Morton, A framework for management information systems, Sloan Management Review 13 (1) (1971) 50 – 70.

[3] R.N. Anthony, Planning and Control Systems: A Framework for Analysis, Harvard University Graduate School of Business Administration, 1965.

[4] K.C. Laudon, J.P. Laudon: Management Information Systems. Managing the Digital Farm,Prentice Hall, pp. 428-508 (2006).

[5] R. McLeod, G. Schell: Management Information Systems, 10th Edition, Prentice Hall, pp. 250-274 (2006).

[6] S. French, M. Turoff: Decision Support Systems, Communications of the ACM, Vol. 50, No 3, pp. 39-40 (2007).

[7] Chien-Chih Yu: A Web-Based ConsumerOriented Intelligent Decision Support System for Personalized E-Services, ACM International Conference Proceeding Series, Vol. 60, pp. 429-437 (2004).

[8] Aamodt A. Plaza, E.(1994): Case–Based Reasoning: Foundational Issues, Methodological Variations, and System Approaches. AI Communications, 7(1).

[9] Bergmann R. (2002). Introduction to Case-Based Reasoning. Centre for Learning Systems and Applications. Department of Computer Science. University of Kaiserslautern. Agraval R., Srikant R. (1994). Fast algorithms for mining association rules. Proc. Int. Conference very large data Bases. Santiago, Chile.

[10] Kania, K. (2002). Identyfikacja i integracja zródel danych temporalnych w organizacji. In: Sroka, H. (Eds): Organizational Support Systems. Katowice: Univerity of Economics.

[11] Parthasarathy S., Zaki M., Ogihara M., Dwarkadas S. (1999). Incremental and Interactive Sequence Mining. ACM Intl. Conf. On Information and Knowledge Management.

[12] Hwang, H.-G., Kua, C.-Y., Yenb, D. C., & Chenga, C.-C. (2002) Critical factors influencing the adoption of data warehouse technology: a study of the banking industry in Taiwan, Decision Support Systems, In Press, Corrected Proof.

[13] O'Donnell, P., Arnott, D., & Gibson, M. (2002) Data warehousing development methodologies: A comparative analysis, Working

Paper, Melbourne, Australia: Decision Support Systems Laboratory, Monash University.

[14] S. K. Lakshmanaprabu et al., "Effective Features to Classify Big Data Using Social Internet of Things," in IEEE Access, vol. 6, pp. 24196-24204, 2018, doi: 10.1109/ACCESS.2018.2830651.

[15] Gupta, S., Rana, A. and Kansal, V., "Comparison of Heuristic techniques: A case of TSP", 10th International Conference on Cloud Computing, Data Science & Engineering (Confluence), DOI: 10.1109/Confluence47617.2020.9058211, pp. 172-177, IEEE Explore, 2020

[16] Shankar, K., Lakshmanaprabu, S.K., Gupta, D. et al. Optimal feature-based multi-kernel SVM approach for thyroid disease classification. J Supercomput 76, 1128–1143 (2020). https://doi.org/10.1007/s11227-018-2469-4

[17] Lakshmanaprabu, S. K., Shankar, K., Gupta, D., Khanna, A., Rodrigues, J. J., Pinheiro, P. R., & de Albuquerque, V. H. C. (2018). Ranking analysis for online customer reviews of products using opinion mining with clustering. Complexity, 2018.

[18] Pandey S. and Kansal V., "Social Media Analytics: An Application of Data Mining" in Book titled "Data Mining in Dynamic Social Networks and Fuzzy Systems", IGI Global, DOI: 10.4018/978-1-4666-4213-3.ch010 , pp. 212-228, 2013

Design of Monitoring Smart Roads with Warning Messages to Diversions according to Climate conditions as well as unexpected Events like Accidents or Traffic Jams

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Abstract: This key goal of this research is to avoid road accidents. Most of the studies clearly show that the majority of incidents take place near certain places such as school areas, dining areas, etc. The purpose of the proposed system is, by signalling or warning through WI-FI, to avoid the accident in nearby areas. If the Bridge zone is narrower than 100 meters from vehicles, a mobile warning will be issued via the WI-FI network. The person reduces the vehicle speed following this indication. Just like if a school area closer to vehicles is within 100 meters, the cell phone will be alerted via WI-FI. The person reduces the speed of the vehicle after this indication. Like Fog, it gives message warning to mobile devices via the WI-FI area within 100 meters. The individual decreases the speed of the vehicle following this indication. This sign helps us to reduce road injuries. We use WI-FI, AT89S52, switches for this implementation. The Wi-Fi module is connected to the controller here in this project and can be controlled from any location at the Internet speed. The managed power supply for this project is 5V 500mA. For voltage power, 7805 three voltage terminal regulators are used. Full-wave bridge rectifier is used to rectify the 230/12V transformer secondary ac output.

1. Introduction

Traffic signal management systems co-ordinate traffic signals for the purposes of achieving network-wide goals for traffic operations. Such systems consist of intersectional traffic signals, a network of communications to link them and a central machine or machine network to control the system. A set of strategies, including time base and hardwired communication approaches, may enforce coordination. Coordination. Agency-wide co-ordination of traffic signals includes the establishment of agreements on data sharing and traffic signal control. Therefore the establishment of formal or informal agreements to exchange knowledge about the traffee regulation and control of signal service across jurisdictions are a key institutional component of Traffic Signal Management. To order to provide control, signal synchronization systems are mounted. There is no other reason for a traffic signage system than to provide motorists with a positive signal time. The program provides functions that maximize the capacity of the engineer to accomplish this objective. Those are primarily control characteristics. They have access for maintenance and operations to the intersection signal controller. The more complete and relaxed the connection the more efficient and effective the operator would be. Current systems also have wide-ranging monitoring features, including various forms of traffic detection and video tracking, as well as traffic signal control. These also offer more efficient algorithms for traffic management, including the possibility of adaptive and predictive management. A low-cost camel detection and IoT-based Introduced KSA warning systems. Those are devices Connect to internet and stop drivers of vehicles The impact from the horse. The primary benefits of the proposal IT dependency and low traffic are the rule over similar systems Specifications. Specifications. This can also be used for surveillance and Anywhere repair. In addition, congestion in the network The likelihood is small, allowing the machine reliability and efficiency Trustworthy [1]. Most incidents are caused by loose events camels on roads and the use of mobile phones [2]. [1]. A functional framework for KSA must therefore be implemented Reduction of crashes for camel vehicle. Any program for preventing accidents in animals is broken the animal identification part and the two main parts; Piece of warning. An list of animals already used In Switzerland, detection systems are the only. 81.52% of the overall Net drop of significant animal injuries [3]. Several animal detection study is possible and its Systems for driver alert [3]. Common methods including Alert signs / lighting, road fence, etc. are very necessary Installation as well as maintenance costs [4 ,5] are high. And Other Wireless network sensor technology is effective Consumption and maintenance costs [6–11] terms and conditions of electricity. While techniques based on wireless sensor systems like [4] suffer. wide alarms and inaccuracy of false detection. Additionally, most of these researches are not suitable for the Detection of camels and KSA desert tracks. In addition, the implementation and the maintenance may be very costly.

Traffic and road safety rules are not a new concept, societies for many decades have traffic rules in place to maintain law and order on the roads and to ensure safety of the drivers and pedestrians too. Developing countries face the problem of crowded and congested roads because of the inefficient implementation of traffic rules. There is a lack of awareness about the rules to the commutator. In addition, Drivers also tend to ignore the rules often. Also, it is particularly challenging to new drivers operating on unfamiliar roads to follow rules. This is one of the main reasons for accidents. Hence, it is necessary to develop a system that assists the driver about the traffic or road safety rules while steering and to automate the response of the automobile upon the driver's ignorance to follow the rules. The major concern of traffic sense system is to ensure road safety to avoid accidents due to driver's negligence resulting in losses of lives. Thus, an intelligent traffic system that is proposed is advantageous because of its unique features and capabilities of the Internet of Things (IoT) [12, 14-16]. This system in [13] presents a real time road safety monitoring to solve the problems caused due to breaking of rules. The proposed system provides a new way to control traffic rules and a step towards autonomous vehicles which follows the traffic rules. The traffic administration department (Traffic Rules Department of Government) can use this real time road safety monitoring system to detect dangerous situations on the road and thereby react by imposing immediate actions. The data that are stored in database which is present in the cloud are all verified and validated. Automating the traffic rules over a vehicle will thereby cease the driver from violating the traffic rules. The system also helps to limit the speed of the vehicle thus by reducing the risk of accidents.

2. Methodology

The proposed system will have two sections, one is Transmitter section and second one is receiver section. The block diagram in figure 1 shows the transmitter section it contains different zones. Data from that particular zones from the switches and sensors will be given to RF transmitter. RF transmitter transmits the data and at receiver side as shown in the figure 2 it contains the micro controller to process the data, which ha received from the RF receiver. Later after processing we can monitor all the things in the website, as the device is also connected with the WIFI module.

2.1. Transmittersection

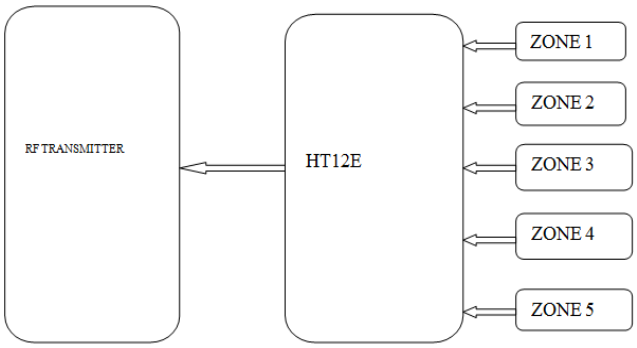

Fig. 1 - Block diagram of transmitter section.

2.2. Receiver Section

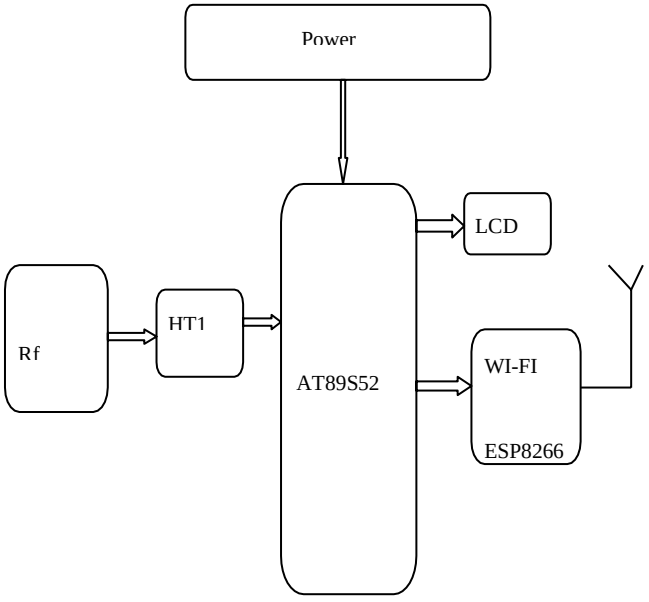

Fig. 2 - Block diagram of receiver section.

3. AT89S52

The AT89S52 is an 8-bit CMOS 8-bit, low-power microcontroller with an in-commission device Flash memory of 8 K bytes. The unit is manufactured with Atmel's non-volatile high-density memory technology and compliant with the industrial standard 80C51 pin and instruction set. The Flash feature allows you to reprogram your program memory either via your device or through a non-volatile traditional memory programmer. The Atmel AT89S52 is a powerful microcontroller that provides a highly flexible and economic solution for many embedded control application by integrating a versatile, 8 bit CPU with a Flash programmable device on a monolithic chip. The AT89S52 features 8 K bytes of Flash, 256 bytes of RAM, 32 I / O blocks, a monitor timer, two data points, three 16-bit timers / counters, a double-speed architecture of six vectors, a total duplex serial port, onchip oscillator, clock circuitry. However, the AT89S52 is equipped with a static operating logic to null frequency and supports two power saving modes for program choices. The Idle Mode prevents the CPU and allows the RAM, timer, serial port and system interrupt working. Power-down saves the con-tents of RAM but freezes the OSC before the next interruption is through.

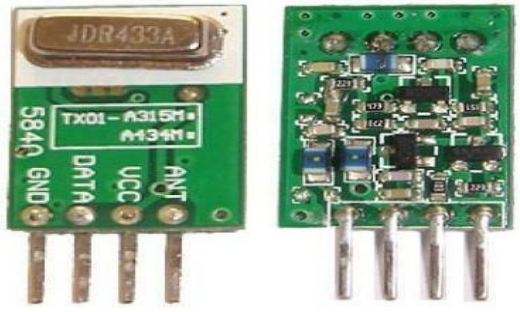

Fig. 4 - RF Module.

4. RF Module

The STT-433 is ideal for remote control applications requiring low cost and a longer range. The transmitter is supplied with 1.5-12V and is thus suitable for applications with battery power. The transmitter uses a SAW-stabilized oscillator to ensure accurate frequency control for the best output. Easy to control output power and harmonic emissions, making compliance with FCC and ETSI simple. The STT-433 is suitable for high volume applications, thanks to its production friendly SIIP style and low-cost package.

Fig. 3 - 8052 Micro Controller.

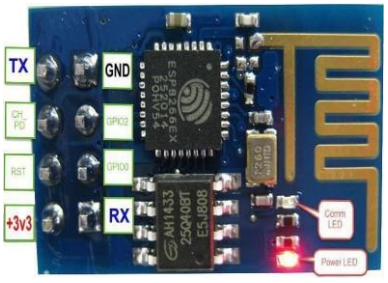

Fig. 5 – WIFI Module.

5. ESP 8266

ESP8266 offers a full Wi-Fi networking solution, which enables the device to be hosted or the Wi-Fi network to be accessed from another application processor.ESP8266 is able to boot directly from an external flash if the device is hosting and the only device processor in the devise. It is built-in cache to boost device performance and memory requirements in these applications.Additionally, wireless internet access via UART interface or CPU AHB bridge interface can be applied to any

microcontroller-based system as a Wi-Fi adapter. Espresso if's ESP8266EX offers a highly optimized WiFi SoC solution that satisfies user needs for efficient power consumption, compact design and reliable performance on the Internet of Things industry. ESP8266EX is able to operate as a standalone application or as a host MCU slave, thanks to complete and self-contained Wi-Fi networking capabilities. The program begins immediately as ESP8266EX hosts the script. The built-in high-speed cache adds to system stability and system memory optimization. The ESP8266EX can also be used as an SPI / SDIO or I2C / UART interface for all Microcontroller designs as a Wi-Fi adaptor.ESP8266EX integrated antenna switches, RF, control amplifier, amplifier, filters and modules for power management. The compact design reduces the size of the PCB and needs minimal external circuits. As well as the Wi-Fi features, an improved version of the Tensilica 32-bit Diamond Processor and on-chap SRAM series is also available in the ESP8266EX. It can be linked via GPIOs to external sensors and other devices. Sample codes for different applications are issued by the Software Development Kit (SDK). The Expressive Systems Smart Connectivity Platform (ESCP) provides the possibility to use advanced signal processing, spur-calling and radio co-existence mechanisms for common cellular, Bluetooth, DD Radiation (DDR), LVDS and LCD interference control to quick switching between sleep and wakeup mode.

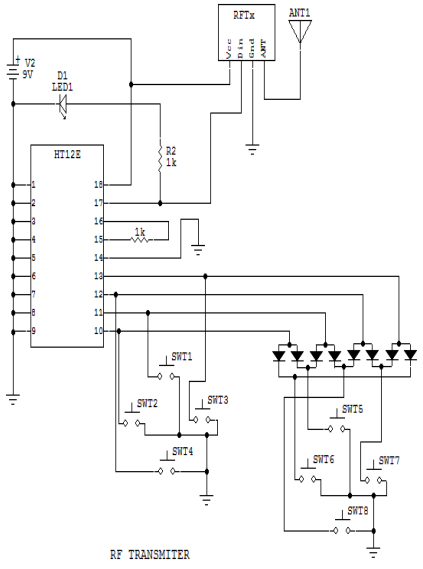

Fig. 6 – Circuit Diagram RF Transmitter .

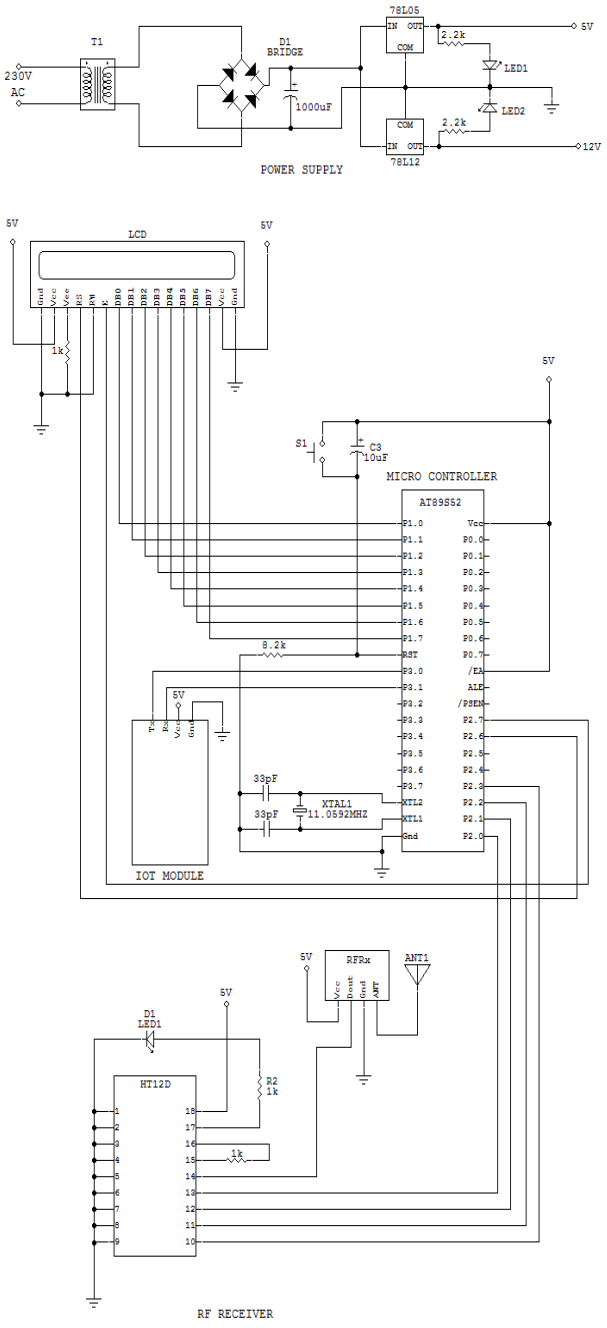

Fig. 7 – Circuit Diagram RF Receiver.

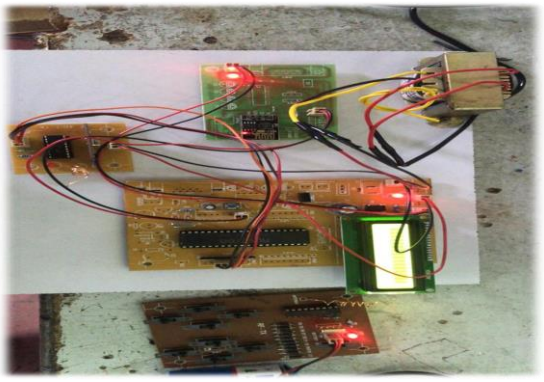

Fig. 8 – Hardware Diagram RF Transmitter.

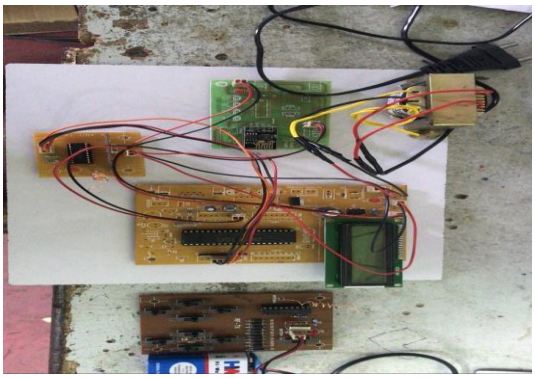

Fig. 9 – Hardware Diagram RF Transmitter.

6. Conclusion

The Design of Monitoring Smart Roads with Warning Messages to Diversions according to climate conditions as well as unexpected events like Accidents or Traffic Jamshas been successfully designed and tested. It has been built with the integration of all the hardware components used. The existence of each module was reasoned out and carefully positioned so that the device functions best. Furthermore, the project was successfully carried out using highly advanced ICs and with the aid of that

REFERENCES

[1]. Waleed Saad ; Abdulaziz S. Alsayyari, "Real Time IoT Based Camel-Vehicle Collision Avoidance System for KSA", 2020 3rd International Conference on Computer Applications & Information Security (ICCAIS), 19-21 March 2020.

[2]. "https://www.arabianbusiness.com/camels-involved-in-97-of-sauditrafficaccidents587265.html," Ckecked Online on 7/7/2019.

[3]. M. P. Huijser, T. D. Holland, A. V. Kociolek, A. M. Barkdoll, J. D.Schwalm, et al., "Animal–vehicle crash mitigation using advancedtechnology. phase ii: System effectiveness and system acceptance,"Final report SPR, vol. 3, p. 076, 2009.

[4]. W. Saad and A. Alsayyari, "Loose animal-vehicle accidents mitigation:Vision and challenges," in 2019 International Conference on InnovativeTrends in Computer Engineering (ITCE), pp. 359–364, IEEE, 2019.

[5]. M. O. Bashir and F. M. Abu-Zidan, "Motor vehicle collisions with largeanimals.," Saudi medical journal, vol. 27, no. 8, pp. 1116–1120, 2006.

[6]. A. P. Clevenger, B. Chruszcz, and K. E. Gunson, "Highway mitigationfencing reduces wildlife vehicle collisions," Wildlife Society Bulletin,pp. 646–653, 2001.

[7]. M. Shokair, S. EEl-Rabie, W. Saad, A. Benaya, et al., "A novel energyefficient routing protocol using sink mobility for wireless sensornetworks," IET Wireless Sensor Systems, 2019.

[8]. A. E. Fawzy, M. Shokair, and W. Saad, "Balanced and energy-efficientmulti-hop techniques for routing in wireless sensor networks," IETNetworks, vol. 7, no. 1, pp. 33–43, 2017.

[9]. A. A. Qasem, A. E. Fawzy, M. Shokair, W. Saad, S. El-Halafawy, andElkorany, "Energy efficient intra cluster transmission in gridclustering protocol for wireless sensor networks," Wireless PersonalCommunications, vol. 97, no. 1, pp. 915–932, 2017.

[10]. A. Amer, A. E. Fawzy, M. Shokair, W. Saad, S. El-Halafawy, and A.Elkorany, "Balanced energy efficient grid based clustering protocol forwireless sensor network," International Journal of Computing andDigital Systems, vol. 6, no. 01, pp. 1–12, 2017.

[11]. A. E. Fawzy, A. Amer, M. Shokair, and W. Saad, "An efficient design ofcluster size for maximizing outcomes of direct transmission in clusterbasedwireless sensor networks," International Journal of Computingand Digital Systems, vol. 5, no. 05, 2016.

[12]. A. E. Fawzy, A. Amer, M. Shokair, and W. Saad, "Four-layer routingprotocol with location based topology control of active nodes in wsn," in2016 11th International Conference on Computer Engineering &Systems (ICCES), pp. 66–72, IEEE, 2016.

[13]. Ananya M B ; Nisarga N C ; Vardhini V Hebballi ; S B Rudraswamy, "Semi-Automted IoT Vehicles", 2019 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), "26-27 July 2019.

[14]. Alqaralleh, B.A.Y., Vaiyapuri, T., Parvathy, V.S. et al. Blockchain-assisted secure image transmission and diagnosis model on Internet of Medical Things Environment. Pers Ubiquit Comput (2021). https://doi.org/10.1007/s00779-021-01543-2

[15]. S. K. Lakshmanaprabu et al., "Effective Features to Classify Big Data Using Social Internet of Things," in IEEE Access, vol. 6, pp. 24196-24204, 2018, doi: 10.1109/ACCESS.2018.2830651.

[16]. I. V. Pustokhina, D. A. Pustokhin, D. Gupta, A. Khanna, K. Shankar and G. N. Nguyen, "An Effective Training Scheme for Deep Neural Network in Edge Computing Enabled Internet of Medical Things (IoMT) Systems," in IEEE Access, vol. 8, pp. 107112-107123, 2020, doi: 10.1109/ACCESS.2020.3000322.

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WEB BASED GRAPHICAL PASSWORD AUTHENTICATION SYSTEM

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ABSTRACT:

Graphical passwords provide a promising alternative to traditional alphanumeric passwords. They are attractive since people usually remember pictures better than words. In this extended abstract, we propose a simple graphical password authentication system. We describe its operation with some examples, and highlight important aspects of the system.

Keywords: Password, graphical, high security.

1. INTRODUCTION:

User authentication is a fundamental component in most computer security contexts. It provides the basis for access control and user accountability [1]. While there are various types of user authentication systems, alphanumerical username/passwords are the most common type of user authentication. They are versatile and easy to implement and use.

Alphanumerical passwords are required to satisfy two contradictory requirements. They have to be easily remembered by a user, while they have to be hard to guess by impostor [2]. Users are known to choose easily guessable and/or short text passwords, which are an easy target of dictionary and brute-forced attacks [3, 4, 5]. Enforcing a strong password policy sometimes leads to an opposite effect, as a user may resort to write his or her difficult-to-remember passwords on sticky notes exposing them to direct theft.

In the literature, several techniques have been proposed to reduce the limitations of alphanumerical password. One proposed solution is to use an easy to remember long phrases (passphrase) rather than a single word [6]. Another proposed solution is to use graphical passwords, in which graphics (images) are used instead of alphanumerical passwords [7]. This can be achieved by asking the user to select regions from an image rather than typing characters as in alphanumeric password approaches.

In this extended abstract, we propose a graphical password authentication system. The system combines graphical and text-based passwords trying to achieve the best of both worlds. In section 2, we provide a brief review of graphical passwords. Then, the proposed system is described in section 3. In section 4, we briefly

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discuss implementation and highlight some aspects about the proposed system.

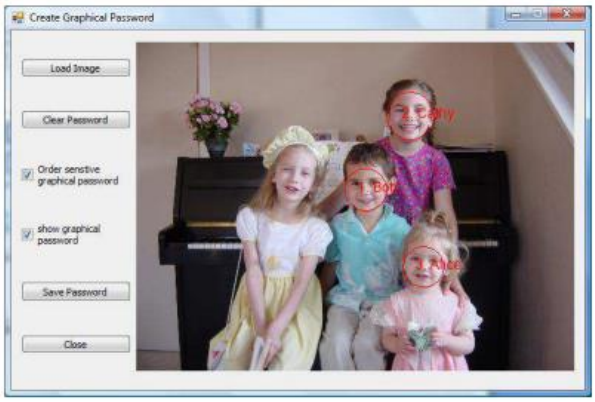
2. EXICITING SYSTEM:

Graphical passwords refer to using pictures (also drawings) as passwords. In theory, graphical passwords are easier to remember, since humans remember pictures better than words [8]. Also, they should be more resistant to brute force attacks, since the search space is practically infinite. In general, graphical passwords techniques are classified into two main categories: recognition-based and recall based graphical techniques [7]. In recognition-based techniques, a user is authenticated by challenging him/her to identify one or more images he or she chooses during the registration stage. In recall-based techniques, a user is asked to reproduce something that he or she created or selected earlier during the registration stage. Passfaces is a recognition-based technique, where a user is authenticated by challenging him/her into recognizing human faces [9]. An early recall-based graphical password approach was introduced by Greg Blonder in 1996 [10]. In this approach, a user create a password by clicking on several locations on an image. During authentication, the user must click on those locations. PassPoints builds on Blonders idea, and overcomes some of the limitations of his scheme [2]. Several other approaches have been surveyed in the following paper [7].

PROPOSED SYSTEM:

The proposed authentication system works as follows. At the time of registration, a user creates a graphical password by first entering a picture he or she chooses. The user then chooses several point-of-interest (POI) regions in the picture. Each POI is described by a circle (center and radius). For every POI, the user types a word or phrase that would be associated with that POI. If the user does not type any text after selecting a POI, then that POI is associated with an empty string. The user can choose either to enforce the order of selecting POIs (stronger password), or to make the order insignificant.

In Figure 1, we show an example of a user creating a graphical password. In this example, the user chooses a picture of his or her kids by pressing "Load Image button". Then the user clicks on the kids faces in the order of their ages (order is enforced). For each selected region, the user types the kid's name or nickname.



For authentication, the user first enters his or her username. The system, then, displays the registered picture. The user, then, has to correctly pick the POIs and type the associated words. At any time, typed words are either shown as asterisks (*) or hidden. In Figure, we show an example of the login screen.

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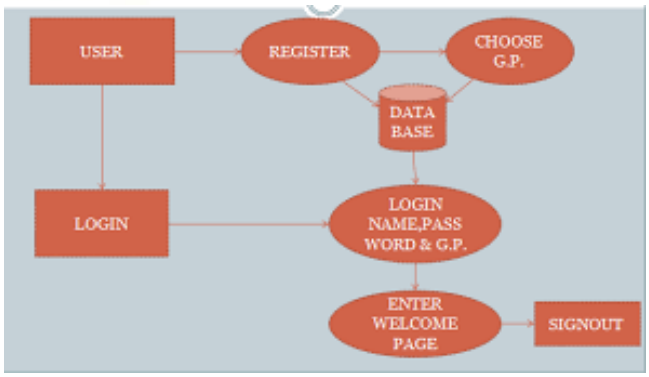


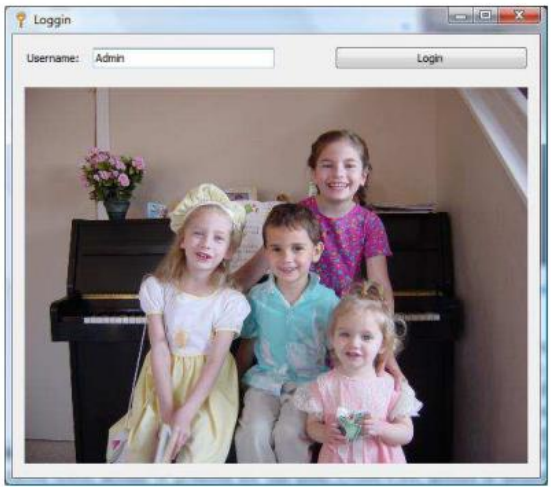
3. METHODOLOGY

The proposed system was implemented using Visual Basic .net 2005 (VB.net). The implementation has three main classes:

• Login Info: Contains username, graphical password, and related methods.

• Graphical Password: Contains graphical password information and related methods.

• Sel Reg: Contains fields about selected regions (POIs).

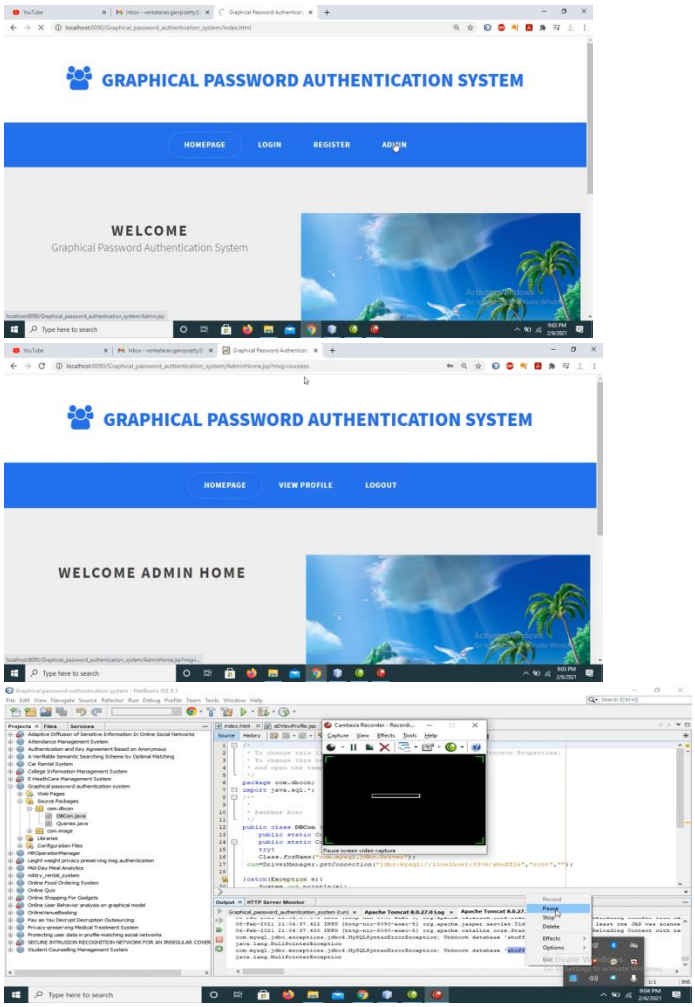


In the proposed system, a user freely chooses a picture, POIs and corresponding words. The order and number of POIs can be enforced for stronger authentication. Together, these parameters allow for a very large password space. We believe that proposed approach is promising and unique for at least two reasons

• It combines graphical and text-based passwords trying to achieve the best of both worlds.

• It provides multi-factor authentication (graphical, text, POI-order, POI-number) in a friendly intuitive system.

OPERATION:



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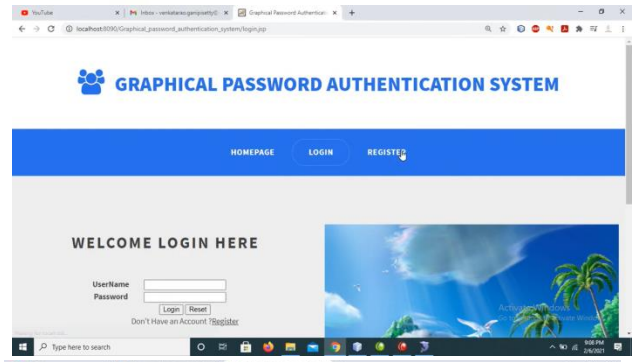

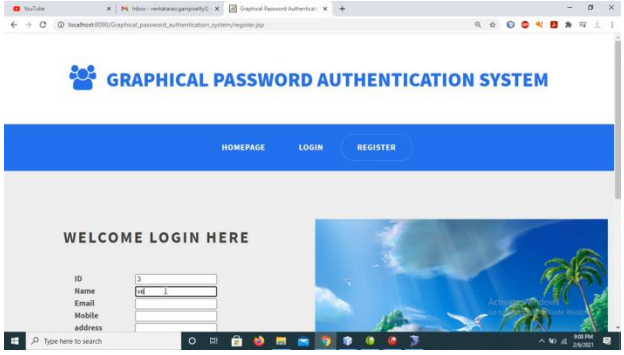

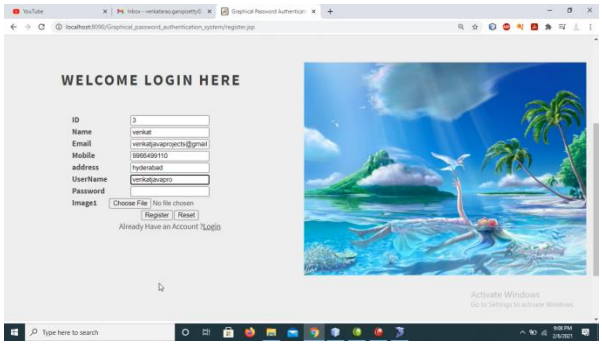

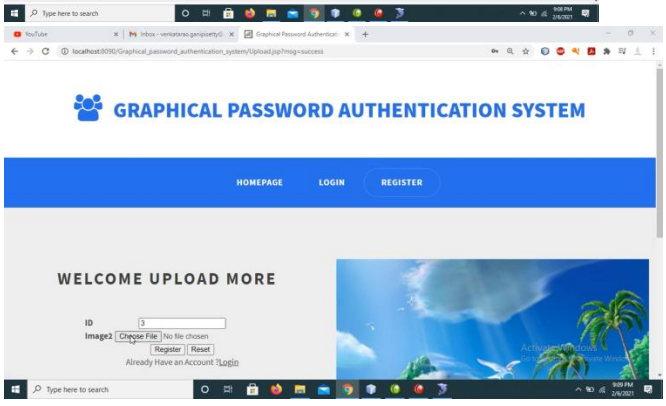

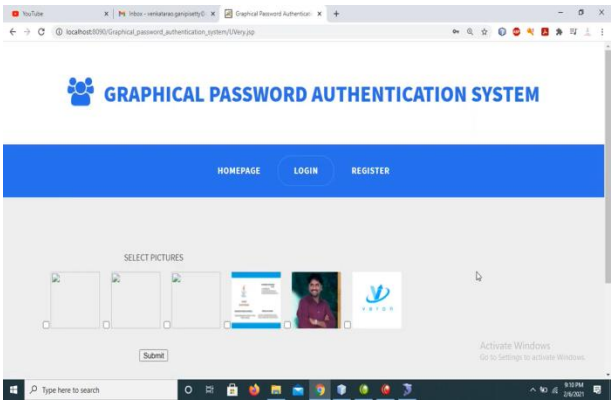

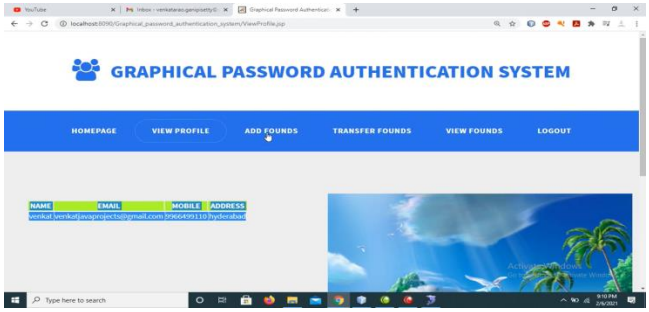

CONCLUSION

User authentication is a fundamental component in most computer security contexts. In this extended abstract, we proposed a simple graphical password authentication system. The system combines graphical and text-based passwords trying to achieve the best of both worlds. It also provides multi-factor authentication in a friendly intuitive system. We described the system operation with some examples, and highlighted important aspects of the system.

REFERANCES

[1] William Stallings and Lawrie Brown. Computer Security: Principle and Practices. Pearson Education, 2008.

[2] Susan Wiedenbeck, Jim Waters, Jean-Camille Birget, Alex Brodskiy, and Nasir Memon. Passpoints: design and longitudinal evaluation of

a graphical password system. International Journal of Human-Computer Studies, 63:102–127, July 2005.

[3] Robert Morris and Ken Thompson. Password security: a case history. Communications of the ACM, 22:594– 597, November 1979.

[4] Daniel V. Klein. Foiling the Cracker: A Survey of, and Improvements to, Password Security. In Proceedings of the 2nd USENIX UNIX Security Workshop, 1990.

[5] Eugene H. Spafford. Observing reusable password choices. In Proceedings of the 3rd Security Symposium. Usenix, pages 299–312, 1992.

[6] Sigmund N. Porter. A password extension for improved human factors. Computers & Security, 1(1):54 – 56, 1982.

[7] Xiaoyuan Suo, Ying Zhu, and G. Scott Owen. Graphical passwords: A survey. In Proceedings of Annual Computer Security Applications Conference, pages 463–472, 2005.

[8] Antonella De Angeli, Lynne Coventry, Graham Johnson, and Karen Renaud. Is a picture really worth a thousand words? exploring the feasibility of graphical authentication systems. International Journal of Human-Computer Studies, 63:128–152, July 2005.

[9] Real User Corporation. The science behind passfaces, June 2004.

[10] G. E. Blonder. Graphical password. U.S. Patent 5559961, Lucent Technologies, Inc. (Murray Hill, NJ), August 1995.