

nd





PROCEEDINGS

Scopus

INTERNATIONAL CONFERENCE ON WIRELESS SENSOR NETWORKS, UBIQUITIOUS COMPUTING, AND APPLICATIONS - 2021 26 - 27 February 2021

> Organized by Department of Computer Science and Engineering

> > Gokaraju Rangaraju Institute of Engineering and Technology www.griet.ac.in | www.icwsnuca.com

SOUVENIR





2nd INTERNATIONAL CONFERENCE ON WIRELESS SENSOR NETWORKS, UBIQUITIOUS COMPUTING & APPLICATIONS -2021 26 - 27 February 2021



Convenor Dr.Padmalaya Nayak Co-Convenor Dr. K. Madhavi Dr. Neeraj Mohan Dr. Surabhi Guptha

Gokaraju Rangaraju Institute of Engineering and Technology www.griet.ac.in | www.icwsnuca.com







MESSAGE

I am pleased to know that the Department of Computer Science and Engineering of GRIET is organizing Second International Conference on Wireless Sensor Networks, Ubiquitous Computing and Applications 2021 (ICWSNUCA-2021) a prestigious event of GRIET during 26-27 February 2021.

I feel happy to know that this conference aims at Wireless Sensor Networks Applications, Advanced Communication Protocols, Modeling and Simulations, Mobility Modeling, Performance and Security measures, which is in-line with the "Digital India programme" a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. The vital driving force for any countries GDP being its trained manpower, it is apt that academic institutions such as GRIET play a major role in training the manpower as well as carrying out the innovations in the field of Wireless Sensor Network exploiting the latest information and knowledge, basing and exploiting sound scientific principles in order to attain quality and productivity. This conference under the age is of ICWSNUCA, hence is very pertinent.

My best wishes and appreciation for the organizing team.

(Dr. G. Ganga Raju)



Sri GVK Ranga Raju

Vice-President Gokaraju Rangaraju Educational Society



MESSAGE

I am extremely happy to know that the Department of Computer science and Engineering of GRIET in performing a commendable exercise in conjuring the confluence of noted members from the academia, researchers and practicing engineers to present, discuss and transfer knowledge pertaining to the various facets and applications of Wireless Sensor Networks (WSNs) and various computing technologies.

This International Conference on Wireless Sensor Networks, Ubiquitous Computing and Applications 2021 (ICWSNUCA-2021) will provide an excellent platform for sharing knowledge and results in theory, various computing methodologies, applications of WSN and 4G/5G networks. In the last few years WSNs have drawn the attention of the research community, driven by a wealth of Internet of Things (IoT) and practical challenges. I strongly believe that this International Conference will provide a platform to all the Young Engineers, Research scholars across the Nation to come closer to gain the rich experience about the WSN, Information, Embedded and Communication Systems from Reputed Experts and Industrialists.

I convey my best wishes to the organizers and the delegates for a successful conference.

(GVK Ranga Rajū)





Mr. M.G. Sekharam CEO

MESSAGE

I am pleased to know that the Department of Computer Science and Engineering of GRIET is organizing two-day "2nd International Conference on Wireless Sensor Networks, Ubiquitous Computing, and Applications (ICWSNUCA-2021)" a prestigious event of GRIET during 26-27 February 2021.

I feel happy to know that this conference aims at advanced communication protocols, modeling and simulations, mobility modeling, performance, and security measures, which will provide an excellent platform for sharing knowledge and results in theory, methodology, and various applications of WSNs. This progressive research in WSNs explored in various new applications enabled by larger scale networks of sensor nodes capable of sensing information from the environment, process the sensed data and transmits it to the remote location.

I strongly believe that it will provide an excellent opportunity to the participants to discuss the most relevant professional issues and exchange the latest experience and ideas on IT, CS, Network Engineering, and technology.

My best wishes and appreciation for the organizing team, all the participants, and delegates for a successful International Conference.

Meelus

Mr. M.G. Sekharam





Dr.Jandhyala N Murthy Director

MESSAGE

I am extremely happy to know that Department of Computer Science and Engineering is organizing two-day "2nd International Conference on Wireless Sensor Networks, Ubiquitous Computing and Applications 2021 (ICWSNUCA-2021)" on 26-27 February 2021.

It is heartening to know that the conference will collect the latest research within the field of real-time systems engineering and will serve as a vital reference compendium for practitioners and academics. From a wide variety of fields and states, the authors of this collection are the respective experts in their areas of concentration, giving the latest case studies, methodologies, frameworks, architectures, best practices, and research as it relates to real-time systems engineering for WSN.

It is welcoming factor to note that this conference has created a cross disciplinary participation that transcends Departmental, Institutional, Industrial, Public and Private research organizations and breaks local, national, and international barriers thus facilitating the integration of research and education in the vital field of advanced WSN.

I convey my best wishes to all the delegates, participants, and the organizers for a successful International conference.

Dr. Jandhyala N Murthy





Dr. KVS.N Raju Senior AO

MESSAGE

I am extremely happy to know that Department of Computer Science and Engineering is organizing two-day "2nd International Conference on Wireless Sensor Networks, Ubiquitous Computing and Applications 2021 (ICWSNUCA-2021)" on 26-27 February 2021.

I strongly believe that this International Conference will provide a platform to all the young Engineers, Research scholars world-wide to come closer to gain the rich experience about the WSN, Information, Embedded, and Communication Systems from reputed Experts and Industrialists. It will give an excellent opportunity to the participants to discuss the most relevant professional issues and exchange the latest experience and ideas on IT, CS, and communication technology.

I convey my best wishes to the organizers and the delegates for a successful conference.

Dr. KVS.N Raju





Dr. J. Praveen Principal

MESSAGE

I am happy to note that the Department of Computer Science and Engineering is organizing two-day "2nd International Conference on Wireless Sensor Networks, Ubiquitous Computing, and Applications 2021 (ICWSNUCA-2021)" on 26-27 February 2021. With the rapid growth of Wireless Communication, Wireless Sensor Network plays a vital role in Internet of Things (IoT), Big data, Cloud Computing etc. Sensor nodes are the backbone of these technologies and these nodes can be worn, carried, embedded in the environment that can provide interesting contextual information in different applications like civil, military, defense, health care, agriculture to environmental monitoring.

This conference, we expect, shall offer the right platform for the academicians, researchers, and enthusiast Industry experts to discuss and disseminate the state of the art information on the context of wireless networks applications and the communication processing, characterization, challenges and possible contemporary solutions for next generation networks.

I extend my best wishes to all the participants, organizers, delegates and wish the Conference a grand success.

Dr. J. Praveen





PREFACE

Recent years, we have been hearing about Internet of Things, Industrial IoTs (IIoT), Industry 4.0, Smart Factories, Smart HealthCare, Smart Logistic and Supply Chains, Smart Mobility, and Smart Energy etc. These technologies deliver huge economy and financial benefits and will continue the same in near future. But surprisingly, sensor nodes are the backbone of these technologies and these nodes can be worn, carried, embedded in the environment that can provide interesting contextual information. We find sensors in our daily life, starting from Mobile devices, Automobiles, Industrial automation, Robotic systems, Vehicular Tracking and Management Systems etc. A significant increase in real world event monitoring capability with Wireless Sensor Networks will lead to a further evolution of ubiquitous computing. Further, device to device communication is a promising concept and will be integral part of IoT to improve the resource utilization.

The aim of this International Conference is to converge all the issues in a single platform and provide an International forum to discuss the real-time problems and solutions for it. This conference mainly aims at advancedCommunication Protocols, Modeling and Simulations, Mobility Modeling, Performance and Security Measures.

I hope that this special issue published by Springer Proceedings will be of immense use as a reference material for Students, Teachers and Industries in the coming modification technologies in the field of WSN and its intended application. Many participants from foreign Universities, Indian research organizations, Premier Institutions like IITs, NITs and Central Universities have shared their valuable experiences.

I want to express my sincere thanks to all the Key Note Speakers, Invited Scientists from various Institutions and the Contributing Authors for the success of this conference.

Dr. Padmalaya Nayak Convenor ICWSNUCA -2021 Dr. K Madhavi Dr. Neeraj Mohan Dr. Surabhi Guptha Co-Convenor ICWSNUCA -2021

ADVISORY COMMITTEE

Dr. Ganapati Panda Dr. K.R Suresh Nair Dr. V. Kamakshi Prasad Dr. Atul Negi Dr. S. Krishna Kumar Dr. Siba k Udgata Dr. Prakash K. Ray Dr. S. Viswanadha Raju IIT, Bhubaneswar

Chief Technology Officer

JNTUH, Hyderabad

University of Hyderabad, Hyderabad DRDO, Chennai

Hyderabad Central University

IIIT, Bhubaneswar

JNTUH, Hyderabad

TECHNICAL PROGRAM MEMBERS

Dr. Srinivas Chakravarthy Dr. Sayyad Mohiddin Dr. Manas Ranjan Patra Dr. Elsa Estevez Dr. Ismail Saad Dr. Wan Abul Rahim Wan Mohd Isa Prof. Raghunandan Reddy Alugubelli Dr. Mohammad S Hasan Dr. Md. Ahsan Habib Dr. Md. Abdur Razzaque Dr.Selvakumar Samuel Dr. E. Balamurugan Dr. Brijesh Kumbhani Dr.Aryabhhatta Sahu Dr. Prasant Kumar Sahu Dr. Chandrashekhar Bhende Dr. T. Ramakrishnudu Dr.B.N.Bhandari Dr. Debadatta Pati Dr.Pravati Swain Dr.Subhransu Ranjan Samantray Dr.Aruna Tiwari Dr.KameswariChebrolu Dr.Rajib. Kumar Panigrahi Dr. DVLN Somayajulu Dr.Asit Mohanty Dr. Neeraj Mohan Dr.Diptendu Sinha Roy Dr.Gayadhar Panda Dr.Prabeen Kumar Padhy Dr.VivekanandanKaniappan Dr.Sraban Kumar Mohanty Dr. K. P. Supreethi Dr.Chapram Sudhakar Dr. V. Valli Kumari Dr.Karthikeyan S.S Dr. S. Kanimozhi Suguna

Dr. Sudhansu Sekhar Singh Dr. Niranjan Ray Kettering University, USA Think Soft, Australia Berhampur University, Odisha National University of South Argentina University of Malaysia, Sabah Univ. Technology MARA, Malaysia MCC Univ. of South Florida Staffordshire Univ ,United Kingdom MBST University ,Bangaladesh University of Dhaka, South Korea Asia Pacific University and Technology, Malaysia Bluecrest College, Accra Ghana IIT,Ropar IIT,Guwahati IIT, Bhubaneswar IIT, Bhubaneswar NIT, Warangal JNTUH, Hyderabad NIT, Nagaland NIT.Goa **IIT.Bhubaneswar** IIT,Indore **IIT**, Bombay IIT,Roorkee NIT, Warangal CET, Bhubaneswar **IKGPTU**, Jalandhar NIT, Meghalaya NIT, Meghalaya **IIITDM**, Jabalpur Bharathiar University, Coimbatore **IIITDM**, Jabalpur JNTUH, Hyderabad NIT, Warangal Andhra University IIITDM,Kanchipuram SASTRA DEEMED University, Thanjavur KIIT, Bhubaneswar KITT.Bhubaneswar

Dr.Ghaida Muttashar Abdulsahib

Dr. M. Nageswar Rao Dr. P. Vidya Sagar Prof. K. Suvarna Vani Prof. Somya Goyal University of Technology-Iraq,Baghdad, Iraq KL University,Vijayawada, AP KL University,Vijayawada, AP VR Siddhartha Engineering College,AP SCIT Manipal University Jaipur, Rajasthan

ORGANIZING COMMITTEE

Chief Patrons

Dr. G. Ganga Raju Sri G.V.K. Ranga Raju **Patrons** Sri M.G.Sekharam Dr.Jandhyala N. Murthy Dr. J. Praveen

General Chair Dr. D.K. Lobiyal,

Honorary Chair Dr. Sheng-Lung Peng Dr. Neel Kanth Grover

Program Chair Dr. Siba K. Udgata,

Convenor Dr.Padmalaya Nayak

Co-Convenors

Dr. K.Madhavi Dr. Neeraj Mlhan Dr.Surbhi Gupta

Publication Chair

Prof. Sheng-Lung Peng Dr Padmalaya Nayak Dr. Souvik Pal President, GRES Vice President, GRES

CEO, GRES Director, GRIET Principal, GRIET

JNU, Delhi, India

National Dong Hwa University, Taiwan IKG Punjab Technical University Kapurthala

University of Hyderabad, India

GRIET, Hyderabad

GRIET, Hyderabad PTU,Punjab GRIET,Hyderabad

National Dong Hwa University, Taiwan GRIET, Hyderabad Global Institute of Management and Technology

Publicity Chair

Dr. G.R. Sakthidharan Dr. Sachinandan Mohanty Dr. Tanupriya Choudhury

Treasurer

Ms.Bh.Prashanthi Ms.T.V.Suneetha

TPC Chair

Dr. Monika Sachdeva

GRIET, Hyderabad ICFAI, Hyderabad Univ. of Petrolium and Energy Studies, Dehradun

GRIET, Hyderabad GRIET, Hyderabad

IKG Punjab Technical University Kapurthala

Internal Organising Committee

Dr. G.R. Sakthidharan Dr G.N.Beena Bethel Dr.G.Ramesh Dr.Surubhi Gupta Ms.D.Krishna Madhuri Ms.Bh.Prashanthi Mr,Y.Krishna Chythanya Ms .K.Adilakshmi Ms.R.N.Ashlin Deepa Ms.T.V.Suneetha Ms.K.Sahithi Ms. Md Nasreen Ms.G.Padmaja Ms.R.Amani Mr. G.Anil Professor Professor Associate Professor Associate Professor Assistant Professor

INDEX

SINo.	Paper ID	Paper Title	Authors Name	Page No.
1	21	Design and Development of Retrieval based Chatbot using Sentence Similarity	Haritha Akkineni,Lakshmi Pvs,Lasya Sarada,Sai Srinija	1
2	33	Detection And Classification Of Intracranial Brain Hemorrhage	Sharada K V,Prashanthi Vempaty,Srinivas Kanakala	2
3	45	Design and simulation of MEMS based Capacitive accelerometer	Amogh Manjunath Rao Morey, Newton Rai,Veena S,Suresh Hl,Habibuddin Shaik,Veda Sandeep Nagaraja	3
4	51	8-Bit Carry Look Ahead Adder Using MGDI Technique	P.Ashok Babu,V. Siva Nagaraju,Rajeev Ratna Vallabhuni	4
5	54	Transport Tracking using RFID and GSM based Technique	Subbulakshmi N,Chandru R,Manimegalai R	5
6	56	An Ultra-Wide Band Patch Antenna for Commercial Communication Applications	L Diana Evangeline,Shine Let G,C Benin Pratap	6
7	57	CNN Based Mobile Device Detection Using Still Images	Pravalika Neela ,Surbhi Gupta,Padmalaya Nayak, Jaafar Al Ghazo	7
8	64	A Pragmatic Study On Movie Recommender Systems Using Hybrid Collaborative Filtering	Akhil M.Nair Preethi Nanjundan	8
9	65	Cluster Formation Algorithm in WSNs to Optimize Energy Consumption Using Artificial Neural Network	Padmalaya Nayak, Gk Swetha,Priyanka Kaushal	9
10	69	Improved Scientific Workflow Scheduling Algorithm with distributed HEFT Ranking and TBW Scheduling Method	Ramandeep Sandhu,Kamlesh Lakhwani	10

11	74	Design and Performance Analysis of Two-port Circularly Polarized MIMO Antenna for UWB Applications	Madan Kumar Sharma,Aryan Sachdeva,Ayushi Ojashwi,Mithilesh Kumar	11
12	79	Dynamic analysis and projective synchronization of A New 4-D System	M. Lellis Thivagar, Ahmed S. Al-Obeidi, B. Tamilarasan, Abdulsattar Abdullah Hamad	12
13	83	Comparative Performance Analysis of Tanh-Apodized Fiber Bragg Grating and Gaussian-Apodized Fiber Bragg Grating as Hybrid Dispersion Compensation Model.	Baseerat Gul,Faroze Ahmad	13
14	84	Implementation of efficient technique to conduct DDoS attack using Client-Server Paradigm	Seema Verma,Ritu Nagpal	14
15	89	Digital Controller Based Automated Drainage Water Monitoring And Controlling	Tadikamalla Sairam Vamsi ,Hari Krishna Chirala, Srinivasaraju, Srinivasarao	15
16	90	Intelligent Tra_c Control System for Emergency Vehicles	Anuj Sachan, Neetesh Kumar	16
17	91	An Anatomization of FPGA based Neural Networks	Anvit Negi,Devansh Saxena,Kunal Sehrawat ,Kriti Suneja	17
18	99	Proficient Dual Secure Multi Keyword Search by Top-k Ranking based on Synonym Index and DNN in Untrusted Cloud	Rosy Swami,Prodipto Das	18
19	102	Transfer learning based detection of COVID-19 using chest CT scan images	Aryaman Chand,Khushi Chandani,Monika Arora	19
20	105	Flow-based Detection and Mitigation of Low-rate DDoS attack in SDN Environment using Machine Learning Techniques	K.Muthamil Sudar, Deepalakshmi P	20

21	107	Improving the Protection of Wireless Sensor Network using a Black Hole Optimization Algorithm (BHOA) on Best Feasible Node Capture Attack	Ankur Khare,Rajendra Gupta,Piyush Kumar Shukla	21
22	108	A Systematic Analysis of the Human Activity Recognition Systems for Video Surveillance	Sonika Jindal,Monika Sachdeva ,Alok Kumar Singh	22
23	109	Fault Tolerant Multimedia Caching Strategy for Information Centric Networking	Dharamendra Chouhan,Sachinkumar Hegde,Srinidhi N N,Shreyas J,Dilip Kumar S M	23
24	111	Cloud-based Parkinson Disease Prediction System using Expanded Cat Swarm Optimization	Ramaprabha Jayaram, Senthil Kumar T	24
25	116	Quality Assisted Spectrum Allocation in Cognitive NOMA Networks	D Prasanth Varma K Annapurna	25
26	118	A Hybridized Machine Learning model for Optimal Feature Selection and Attack Detection in Cloud SaaS Framework	Saisindhutheja Reddy,Gopal K Shyam	26
27	119	English Master Ammu: Advanced Spoken English Chatbot	Gayathri A N,Viji Rajendran V	27
28	126	Prediction of Chemical Contamination for Water Quality Assurance using ML- based Techniques	C. Kaleeswari Chinnakkaruppan,Dr. K.Kuppusamy Krishnamoorthy	28
29	132	A Novel Block Diagonalization Algorithm To Supress Inter-User Interference in a Multi-User MIMO System	Harsha Gurdasani,Dr. A G Ananth,Dr. Thangadurai N	29

30	136	Human Abnormal Activity Pattern Analysis in Diverse Background Surveillance Videos using SVM and ResNet50 model	Manjula S,Lakshmi K	30
31	137	IoT based healthcare system for patient monitoring	Saravanan S,Kalaiyarasi M ,Karunanithi K, S.Karthi, Pragaspathy S,Kalyan Sagar Kadali	31
32	138	Investigation of CNN-based Acoustic Modeling for Continuous Hindi Speech Recognition	Tripti Choudhary,Atul Bansal,Vishal Goyal	32
33	139	Electric Vehicle Monitoring System Based on of Internet of Things (IoT) Technologies	Mohan Thakre,Yogesh Mahadik,Sachin Kamble	33
34	141	Sizing Of Wireless Networks With Sensors For Smart Houses With Coverage, Capacity And Interference Restrictions	Deepa Jose,Jhonatan Meeza, J. S. Prasath	34
35	145	Cooperative Agent based Location Validation for Vehicular Cloudss	Shailaja Mudengudi,Mahabaleshwar Kakkasageri	35
36	146	Energy Conserving Techniques of Data Mining for Wireless Sensor Networks- A Review	Pragati Patil,Atul Raut,Abhimanyu Dutonde	36
37	150	E-FFTF: An Extended Framework for Flexible Fault Tolerance in Cloud	Moin Hasan,Major Singh Goraya,Tanya Garg	37
38	151	ESIT: An Enhanced Lightweight Algorithm for Secure Internet of Things	Manoja Kumar Nayak,Prasanta Kumar Swain	38
39	152	Selection of OLAP Materialized Cube by using a Fruit Fly Optimization (FFO) approach : A Multidimensional Data Model	Anjana Yadav,Dr.Anand Kumar Tripathi	39

40	153	Automatic Attendance Management System using Face Detection and Face Recognition	M Varsha,Chitra S Nair	40
41	154	Integrating IoT With Blockchain: A Systematic Review	Malvinder Singh Bali,Kamali Gupta,Swati Malik	41
42	155	Performance Comparison of Adaptive Mobility Management Scheme with IEEE 802.11s to Handle Internet Traffic	Abhishek Majumder,Sudipta Roy	42
43	156	RT-Gate: Concept of Micro Level Polarization in QCA	K. Bhagya Lakshmi, D.Ajitha ,K.N.V.S. Vijaya Lakshmi	43
44	163	An Interactive Smart Mirror using Internet of Things and Machine Learning	Keval Prajapati,Chintan Bhatt,Hakima Chaouchi	44
45	81	An analytical approach for traffic grooming problems using waiting probability in WDM Networks	Priyanka Kaushal, Neeraj Mohan, Surbhi Gupta, Seifedine Kadry	45

Design and Development of Retrieval based Chatbot using Sentence Similarity

Haritha Akkineni^{1*}, PVS Lakshmi² and Lasya Sarada³

1,2,3 Prasad V Potluri Siddhartha Institute of Technology, Vijayawada,India

akkinenih@gmail.com
papinenivsl@gmail.com
lschitluri@gmail.com

Corresponding Author: [Haritha Akkineni ,akkinenih@gmail.com]

Abstract. Chatbots or the well-known automated conversational agents have become a raging trend among all the sectors of businesses as a result of the rapid transition happening towards automation in processes. They are already being used extensively and will spread their wings to newer horizons in the near future. The basic model of Chatbots is to interact with the user to answer their questions using various modes like text messages, voice replies or any other predefined suitable interface. This paper discusses the development of a Chatbot for the college, Prasad V Potluri Siddhartha Institute of technology, to answer various questions related to the college like the facilities, procedures, policies, etc. This is a web-based software application implemented using Flask framework. This model is designed to capture text inputs from the user through a console and outputs the response in text format using machine learning concepts. A retrieval approach is implemented to process the input and to respond with an appropriate answer using logic adapters. The performance of this model is analyzed using a questionnaire which uses various parameters like performance, humanity, effect and accessibility. This paper presents the overall approach used to design the Chatbot and compare the web-application as- is study with the to-be website when the Chatbot is incorporated. The web application along with the Chatbot showed a 20% improvement in the performance and 5% increase in the accessibility by analyzing the performance metrics.

Keywords: Chatbot, Machine Learning, Retrieval Approach, Flask framework.

Detection and Classification of Intracranial Brain Hemorrhage

K V Sharada^{1*}, Vempaty Prashanthi², and Srinivas Kanakala³

¹Gokaraju Rangaraju Institute of Engineering and Technology,Hyderabad,India aksharada7@gmail.com

²Gokaraju Rangaraju Institute of Engineering and Technology,Hyderabad,India <u>prashuvempaty@gmail.com</u>

³VNR Vignana Jyothi Institute of Engineering andTechnology,Hyderabad,India srinivaskanakala@gmail.com

Abstract. Computer-aided diagnosis systems (CAD), as their name suggests, utilize computers to assist doctors to obtain a quick and correct diagnosis. They focusedon severalscholarsas they are builtupon the concept of processing and examiningpictures of variousparts of the individual body meant for a fast and correctoutcomes. CAD systems are generallyareaspecific because they are augmented for somecertainkinds of infections, various parts of the individual body, diagnosis methods, etc. They analyze dissimilartypes of inputs givenfor examplesigns, test center, result, healthpictures, etc. varying on their territory. One of the maximumcommon kind of diagnosis depends on medical pictures. Our approach is to develop a model to identifyeither a brain hemorrhage is present or not in Computed Topography (CT) scan of the brain and also identify the kindof hemorrhage. The process of detecting and identifying hemorrhage containsmany stepslike image pre-processing, segmentation of image, extracting the features, and classifying the images.

Keywords: CT scan, Brain Haemorrhage, Imageprocessing, Image segmentation

Design and Simulation of MEMS based Capacitive

Accelerometer

Veena.S^{1*},Newton Rai^{1*}, AmoghManjunath Rao Morey^{1*},H L Suresh², Habibuddin shaik¹

^{1*}Nitte Meenakshi Institute of Technology, Bengaluru
 ² Sir. M Visvesvaraya Institute of Technology, Bengaluru

Abstract: Accelerometer is an electromechanical device, which is used for physical measurement along the orthogonal coordinates. Micro Electro Mechanical Systems (MEMS) based capacitive accelerometers are embedded in many modern technological applications. This paper presents the comparison between two single axis MEMS based capacitive accelerometers, which have the natural frequencies of 7 kHz, 2.2 kHz. This work includes design, simulation, analytical modelling, and finite element modelling of each MEMS comb type capacitive accelerometer with different operating frequencies. The accelerometer was designed using COMSOL Multiphysics and MATLAB simulator tool.

Keywords: Accelerometer, MATLAB, COMSOL

8-Bit Carry Look Ahead Adder Using MGDI Technique

P. Ashok babu^{1*}, V. Siva Nagaraju², and Rajeev Ratna Vallabhuni³

^{1,2} Department of Electronics and Communication Engineering, Institute of Aeronautical Engineering, Dundigal-500043, Hyderabad, India <u>p.ashokbabu@iare.ac.in</u> <u>v.sivanagaraju@iare.ac.in</u>

³ Application Developer, Bayview Asset Management, LLC, Florida, USA <u>rajeevratna@ieee.org</u>

Corresponding Author: P. Ashok babu <u>p.ashokbabu@iare.ac.in</u>

Abstract. High-performance and low power consumption are major factors that describe the significance of a design in VLSI. At low and ultra-low power applications, power consumption and logic delays are an important problem. Nowadays, higher performance designs are built on the concept of computation units like ALU where adders and multipliers are the essential components. In terms of speed of operation and power dissipation, the performance of these designs is calculated. To optimize low-power and highperformance applications, adders and multipliers need to be engineered to meet specifications such as speed and power dissipation. Using Modified Gate Diffusion Technique, this paper proposes a carry look ahead adder (MGDI). Compared with other adder models, the Carry look ahead adder has much less propagation delay. The primary purpose of this design is to reduce the delay in propagation, thus reducing the PDP. The proposed adder is implemented on 90nm technologies using the cadence environment. Low power architecture and optimization of speed is the key objective of very large scale integrated (VLSI) circuits. These are the essential problems to be addressed when designing any VLSI circuits. The main objective of this project is to use Modified Gate Diffusion Input (Mod-GDI) Technology to develop and implement a Carry Look Ahead Adder (CLA).

Keywords: ALU; Modified Gate Diffusion Technique (MGDI); Power consumption; Carry look ahead adder; Propagation delay.

Transport Tracking using RFID and GSM based Technique

Subbulakshmi N^{1*}, Chandru R¹, Manimegalai R²,

¹Francis Xavier Engineering College, Tirunelveli, Tamilnadu subbulakshminammalwar@francisxavier.ac.in

²Sri Ramakrishna Engineering College, Coimbatore, Tamilnadu chandru.r@srec.ac.in

³PSG Institute of Technology and Applied Research, Coimbatore, Tamilnadu drrm@psgitech.ac.in

Abstract. Nowadays, the crime has increased and the occurrence of the accidents are more in the cities. People are afraid about the current scenario. Moreover parents are worried on children when they travel to schools. In order to provide protection and safety to the children there is a necessity for a technology based security and alert. In this paper, an idea to identify the status of the children when they are out to school, so that they can identify the location of their children. Using GSM and RFID the tracking of transport is done. It has two units one is Bus unit for tracking the activity and alerting parents during the school travel. Another is School unit for tracking child inside the school. The results shows that our approach will provide safety and security to school children.

Keywords: RFID, GSM module, sensors, GPS module, PIC controller, Tracking system

An Ultra-Wide Band Patch Antenna for Commercial Communication Applications

L Diana Evangeline¹, Shine Let G^{1*}, and C Benin Pratap¹

¹School of Engineering and Technology, Karunya Institute of Technology and Sciences, India *shinelet@gmail.com

Corresponding Author:Shine Let G, shinelet@gmail.com

Abstract. Modern wireless systems require a single antenna to perform multiband functionality considering different applications. As per the FCC report, the designed antenna works in the ultra-wide band from 0.45GHz to 14.37GHz with an impedance bandwidth of 187.8%. For the designed antenna, efficiency is greater than 50 percent and gain is greater than 1dBi for the entire UWB band. By tuning the feed line width, the same antenna can operate in eight narrow bands covering various mobile communication bands, military applications, global positioning system, satellite communication, and some part of Ku band that is from 0.45GHz to 14.37GHz. The designed antenna provides a reflection coefficient of less than-10dBfor all eight narrow bands and has good impedance matching. Moreover, the proposed structure can also support many mobile applications like LTE, Wi-Fi, Wi-Max, and 5G.

Keywords: Ultra-wide Band, Narrow Band, Antenna, Communication, Microstrip Patch.

CNN BASED MOBILE DEVICE DETECTION USING STILL IMAGES

Surbhi Gupta¹,Neela Pravalika², Padmalaya Nayak³,and Jaafar Al Ghazo^{4*}

¹Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, Telangana, India royal surbhi@yahoo.com

²Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, Telangana, India <u>pravalikaneela2611@gmail.com</u>

³Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, Telangana, India <u>drpadmalaya2010@gmail.com</u>

> ⁴Prince Mohammad Bin Fahd University, Saudi Arabia alghazo@gmail.com

Corresponding Author: Jaafar Al Ghazo, alghazo@gmail.com

Abstract: Image forgery has been increased enormously due to the development of information and communication technologies (ICT) and the introduction of new cellular phones. The introduction of new devices leads to inadvertent capturing of images. A source camera identification (SCI) for mobile devices deals with the issue of identification of the mobile device through which image has been taken. Source camera identification empowers the forensic investigator to discover the mobile device model that has been used for capturing the specific image during the investigation. It is important as this digital content is considered as a silent witness. In this paper, we are reviewing the various approaches for SCI which depend on classical machine learning algorithms feature extraction. Then, a CNN model is proposed for identification of mobile device using vision dataset. High accuracy of 92% is achieved for vision dataset.

Keywords: Deep Learning, Source camera identification, convolutional neural network, Mobile devices, sensor fingerprint, feature extraction, and classification.

A Pragmatic Study on Movie Recommender Systems Using Hybrid Collaborative Filtering

Akhil M.Nair¹, Preethi.N²

¹Research Scholar, CHRIST(Deemed to be University), India ²Assistant professor, CHRIST(Deemed to be University), India

akhil.nair@christuniversity.in
preethi.n@christuniversity.in

Abstract. The Movie Recommendation System is part of a comprehensive class of recommendation systems, which categorizes information to predict user preferences. The sum of movies are increasing tremendously day by day and a reliable recommender system should be used to increase user satisfaction. Most of the approaches are made to prevent cold-start, first-rater drawbacks and gray sheep user problems, nevertheless inorder to recommend the related items, there are various methods . Firstly content based method has some drawbacks like data of similar user could not be achieved, and what category of the item- the user likes or dislikes are also not known. Secondly this paper is discussing about collaborative filtering to find both user and item attributes that have been taken into account. Since there exist some issues pictured with collaborative filtering, so this paper further steps into hybrid collaborative filtering and deep learning with K-NN algorithm of ratings of top K-nearest neighbors.

Keywords: Collaborative Filtering, Deep Learning, Cold-Start, First-Rater, Gray Sheep, KNN Algorithm.

Cluster Formation Algorithm in WSNs to Optimize the Energy Consumption Using Self Organizing Map

Padmalaya Nayak¹, GK. Swetha, Priyanka Kaushal

¹Gokuraju Ragaraju Institute of Engineering and Technology, Hyderabad, India padmalaya@griet.ac.in

²Gokuraju Ragaraju Institute of Engineering and Technology, Hyderabad, India swetha.kase@gmail.com

> ³Chandigarh Engineering College, Punjab, India <u>ms.priyankakaushal@gmail.com</u>

Corresponding Author: (swetha.kase@gmail.com)

Abstract—Wireless Sensor Networks (WSNs) are considered as one of the most prevailing technologies in today's world due to the diversified applications. These applications are huge in the range such as environmental monitoring, health care, civil and military, disaster management to other surveillance systems. Minimization of energy is one of the most exciting tasks in WSNs as small sensor nodes are battery powered and deploy in remote environments. Clustering is one such imperative technique that can conserve energy more broadly, and evenly which makes the network operational for a longer period. This research paper aim sat developing an energy-efficient cluster-based routing protocol using Artificial Neural Network (ANN) which finds an optimal number of clusters and rotates the cluster head periodically to balance the energy consumption throughout the network. Typically, the proposed algorithm is developed on the basis Self Organizing Map (SOM) to form the clusters and the K-means algorithm is used to form different size of clusters.Finally, an optimal number of clusters is found that impacts the network load and balances the energy consumption. MATLAB is used as a simulation tool for experimental analysis. Simulation results prove that the proposed cluster-based routing protocol "LEACH-SOM" dominates the traditional LEACH routing protocol in terms of minimal energy consumption and makes the network active for long period.

Index Terms-WSN, LEACH, SOM, K-means.

Improved Scientific Workflow Scheduling Algorithm with distributed HEFT Ranking and TBW Scheduling Method

Ramandeep Sandhu^{1*}, Kamlesh Lakhwani²

^{1*}Lovely Professional University, Phagwara, India nice.ramanchahal@gmail.com

² Lovely Professional University, Phagwara, India kamlesh.20980@lpu.co.in

Abstract. Scheduling is a process that manages the workflow tasks during execution on different resources. Virtual Infrastructure is a dynamic mapping of system resources to applications in order to maximize its utilization. In today's technological world, cloud has taken a long stride on the success towards maximum throughput as well as highest qualitative services to its consumers. Yet, approaches for maximizing the utilization of cloud resources is at peak demand. Each cloud service provider focuses on maximum utilization with minimum consumption of cloud resources. Although, managing and providing computational resources to maximum number of users and to execute such huge applications is a challenging one. In this paper, a scheduling algorithm with name TBW (Tabu Bayesian Whale Optimization) has been proposed. Basically the algorithm is used to target the improvement in scheduling of scientific workflows. The complete framework has firstly used a ranking algorithm named distributed HEFT ranking and then applied TBW algorithm on ranked tasks of input workflows. The work has been executed for five scientific workflows LIGO, MONTAGE, Epigenomics, SIPHT and Cybershake. TBW is using tabu method on workflow tasks for fast local search in cloud system, Bayesian Optimization is used to find out best possible combinations of resources where tasks are mapped and then whale optimization map the tasks on the resources in a smart way. In whole process, total execution time and cost parameters are minimized under deadline constraints.

Keywords: Cloud VMs, Task Mapping, Tabu Search, Bayesian Optimization, Whale Optimization

Design and Performance Analysis of Two-port Circularly Polarized MIMO Antenna for UWB Applications

Madan Kumar Sharma^{1*}, Aryan Sachdeva¹, Ayushi Ojashwi¹, and Mithilesh Kumar²

> ¹Galgotias College of Engineering and Technology, Greater Noida, India <u>madansharma12@gmail.com</u> <u>ayushiojashwi2209@gmail.com</u> <u>ar.16ksp@gmail.com</u>

²Rajasthan Technical University, Kota, India mith_kr@yahoo.com

Corresponding Author: [Dr. Madan Kumar Sharma] <u>madansharma12@gmail.com</u>

Abstract. It proposes and simulates a new Ultra-wide(UWB) Multiple Input Multiple Output(MIMO) circular polarization(CP) antenna. The developed antenna's configuration is uncomplicated and incorporates dual T-shaped feed ports at left and right edges to achieve both LHCP and RHCP at same frequency band. A wide circular slot with a hexagonal stub is created in the ground plane in order to achieve better bandwidth for the realization of UWB. The evolution measures of the antenna put forward are presented ahead in this research paper and it's parameters are designed to obtain the optimal return loss, isolation, polarization and ARBW. Also, a parametric study is done on various types of material chosen as substrate. The parametric study results, portrays that substrate with higher dielectric tends to give poor ARBW. Operating bandwidth (S11<= -10db) of the planned antenna is obtained to be 6.7 GHz (3.4 to 10.1 GHz). An isolation of more than 15dB is also achieved. 3-dB ARBW is obtained in the extent of 3.5-5.5 GHz. Furthermore, the circular polarization features of the antenna proposed are favorable. The surface current and radiation patterns obtained illustrates the circular polarization. Both RHCP and LHCP is obtained at the same frequency in this proposed antenna design. This proposed antenna is a solution to orientation problems of transmitter and receiver, complicated designing, multipath fading and weather penetration. The simulated antenna is a low profile, compact sized antenna simulated for UWB circular polarization and next generation applications.

Keywords: MIMO antennas, Ultra-wide band, Circular polarization, Axial ratio

Dynamic analysis and projective synchronization of a New 4-D System

M. Lellis Thivagar¹ Ahmed S. Al-Obeidi², B. Tamilarasan³, and Abdulsattar Abdullah Hamad^{1*}

> ¹School of Mathematics, Madurai Kamaraj University, Madurai, Tamil Nadu, India <u>mlthivagar@yahoo.com</u>

²Specialty of Mathematics,Gifted School of Nineveh, Directorate of Education Mosul/Nineveh, Iraq ahmedsedeeg@uomosul.edu.ig

³School of Mathematics, Madurai Kamaraj University, Madurai, Tamil Nadu, India <u>btamath@gmail.com</u>

Corresponding: [Abdulsattar Abdullah Hamad <u>satarr198700@gmail.com</u>]

Abstract. A new 4D dissipative hyperchaotic system with an unstable equilibrium point is introduced. The proposed system consists of ten terms including three quadratic nonlinearities which construct by utilizing a nonlinear state feedback controller in the known Lorenz system, it exhibits self-excited attractors and Hyperchaotic Attractors with two positive exponents of Lyapunov. The dynamical properties of this system are analyzed theoretical and numerical simulations based on equilibrium points, stability, dissipative, Lyapunov exponents, and phase portrait. Besides, various coexisting attractors or multistabilityunder the same Para (parameters), having different initial conditions are investigated. Furthermore, Projective Synchronization (PS) of an identical proposed system is realized by nonlinear control strategy and Lyapunov stability theory.

Keywords: 4D hyperchaotic system, Self-excited attractors, MultistabilityProjective synchronization.

Comparative Performance Analysis of Tanh-Apodized Fiber Bragg Grating and Gaussian-Apodized Fiber Bragg Grating as Hybrid Dispersion Compensation Model

Baseerat Gul¹, Faroze ahmad²

^{1,2}Department of Electronics and Communication Engineering. Islamic university of science and technology, Awantipora, J&K, India

lbaseerat.gul@islamicuniversity.edu.in
2drferoz07@gmail.com

Baseerat Gul: baseerat.gul@islamicuniversity.edu.in

Abstract. Fiber optic systems are used for the prolonged reach transmission systems but by increasing the bit rate which is the main requirement of the current time, dispersion gets arisen which results in intersymbol interference. Compensation of dispersion to improve the transmission capability of the fiber optic system provides a vast field for research. From the literature survey done, use of Dispersion compensation fiber has been found most reliable method for compensating the dispersion but it becomes expensive as the length of Dispersion compensation fiber is increased for long distance transmission. Also the Fiber Bragg Grating is used as a dispersion compensation module in the previous reported works but has been found inefficient method. However the Performance of the Fiber Bragg Grating can be enhanced by adapting optimum Chirping technique and Apodization profile. From the previous reported work Tanh-Apodized-Fiber Bragg grating and Gaussian-Apodized-Fiber Bragg grating are found showing optimum performance characteristics in terms of side lobe suppression and maximum reflectivity which motivates us to analyze the respective Fiber Bragg Gratings for compensating the dispersion at various chirping techniques and variable grating lengths. In this work Tanh-Apodized-Fiber Bragg grating and Gaussian-Apodized-Fiber Bragg grating are analyzed and simulated in various chirping techniques individually as well as along with the Dispersion compensation fiber in the hybrid model of dispersion compensation for a 100-km long optical fiber link at the data rate of 10Gbps. The simulation software used is optisystem. Also the grating length has been varied and the different performance characteristics like Q-factor, BER and Eye-diagram are analyzed and compared. It has been observed that the Gaussian-Apodized-quadratic-chirped-Fiber Bragg Grating at the grating length of 26.6mm along with the 11km long Dispersion compensation fiber makes the cheaper dispersion compensation module with the finest performance.

Keywords: Optical fiber communication, Dispersion, Dispersion compensation fiber, Fiber Bragg grating.

Implementation of efficient technique to conduct DDoS attack using Client-Server Paradigm

Seema Rani1*, Ritu Nagpal2

Computer Science & Engineering, GJUS&T, Hisar, India seemaverma1257@gmail.com

² Computer Science & Engineering, GJUS&T, Hisar, India ritu nagpal22@yahoo.co.in

Abstract. In modern times every human being relies upon the internet for fulfilling their hefty needs as the internet offers a vast amount of information to users, so its availability to users is indispensable. Major objectives of security are availability, integrity, and confidentiality. DDoS (Distributed Denial of Service) is a universal cyber-attack that is major intimidation for cyberspace. DDoS attack slows down network availability by overflowing illegal traffic over network bandwidth. Day by day attackers improves upon their strategies by using new technologies and techniques. In this paper, a DDoS attack is proposed using python script. We focus on the volumetric DDoS attack effect on the performance of the server ultimately shutting it down. A DDoS attack is undertaken using a python script on the server in which multiple clients send multiple fake requests to the server to slow down the services/performance of the server.

Keywords: Distributed Denial of Service (DDoS), Denial of Service (DoS), Client, Server, Security, Volumetric DDoS attack, Zombies.

DIGITAL CONTROLLER BASED AUTOMATED DRAINAGE WATER MONITORING AND CONTROLLING

T. Sairam Vamsi^{1*}, Hari Krishna Ch², Srinivasaraju P³,

Srinivasarao G⁴

¹Assistant Professor, SVECW, Bhimavaram, India vamsi.0438@gmail.com

²Associate Professor, SVECW, Bhimavaram, India harikrishnach@svecw.edu.in

³Professor, SVECW, Bhimavaram, India viceprincipal@svecw.edu.in

⁴Professor, SVECW, Bhimavaram, India principal@svecw.edu.in

Abstract. The main purpose of this paper is to replace the manual work in sewage cleaning and monitoring with automation. In this era there is a lack of utilization of technology for sewage disposal tasks. At present, manual effort has been using for drainage cleaning, which leads to lose of human life while cleaning the blockage in pipes. In order to overcome these types of problems "Digital Controller based automated drainage water monitoring and controlling" will be helpful. This project includes PLC (Programmable Logic Controller), which place a vital role in solving real time problems. Using the resource in this paper, it is possible to monitor and control the sewage system continuously without using manual work.

Keywords: PLC, sewage disposal, Automation

Intelligent Traffic Control System for Emergency Vehicles

Anuj Sachan¹, Neetesh Kumar² Indian Institute of Technology-Roorkee

sachan.anuj80@gmail.cm
neetesh@cs.iitr.ac.in

Abstract. Traffic Control System has faced many issues such as high waiting time, resulting from the emission of CO2 (carbon) gas, which results in Environment degradation and the loss of crucial time for the emergency vehicles, which increases impatience in drivers, which could be one of the primary causes of increasing the accidents. There is also a considerable delay in vehicles' arrival time, particularly emergency vehicles that get stuck in the long queue. It is a matter of concern, as these vehicles are being categorized as priority vehicles, so their waiting time should be minimum. The current Traffic Control System does not use any specific algorithm to control the traffic for priority vehicles such as fire-brigade, ambulance. These drawbacks can be resolved by replacing the existing Traffic Control System with a more intelligent Traffic Control System. In this work, we proposed an Intelligent Traffic Control System for Emergency Vehicles model (ITCSEV), which can identify the vehicles and separate them based on their types like "emergency," "passenger." It can change the duration, and traffic signal accordingly. This model has been tested by us through a practical simulation using an open-source simulator, i.e., SUMO (Simulation of Urban MObility), on the map of India's Gwalior city, which demonstrates the efficiency and reliability of the model.

Keywords: Traffic Control System, emergency vehicles, · arrival time, waiting time, SUMO.

An Anatomization of FPGA based Neural Networks

Anvit Negi¹, Devansh Saxena², Kunal³, Kriti Suneja⁴

¹Department of Electronics and Communication Engineering, Delhi Technological University, New Delhi, India <u>anvitnegi24@gmail.com</u>

²Department of Electronics and Communication Engineering, Delhi Technological University, New Delhi, India sdevansh2@gmail.com

³Department of Electronics and Communication Engineering, Delhi Technological University, New Delhi, India <u>kunal99sehrawat@gmail.com</u>

⁴Department of Electronics and Communication Engineering, Delhi Technological University, New Delhi, India kritisuneja@dtu.ac.in

Corresponding Author: Devansh Saxena, <u>sdevansh2@gmail.com</u>

Abstract. Ongoing advancements in the improvement of multilayer convolutional neural organizations have brought about upgrades in the precision of important recognition jobs, for example, huge category picture classification and cuttingedge automated recognition of speech. Custom hardware accelerators are crucial in improving their performance, given the large computational demands of CNNs. The FPGAs reconfigurability, computational abilities and high energy efficacy make it a propitious CNN hardware acceleration tool. Convolution Neural Networks (CNN) have demonstrated their value in picture identification and recognition applications: nonetheless, they require high CPU use and memory transmission capacity tasks that cause general CPUs to neglect to accomplish wanted execution levels. Consequently, to increase the throughput of CNNs, hardware accelerators using application-specific integrated circuits (ASICs), field programmable gate arrays (FPGAs) and graphics processing units (GPUs) have been employed to improve CNN performance. In order to bring out their synonymity and dissimilarity, we group the works into many groups. Thus, it is anticipated that this review will lead to the upcoming development on successful hardware

accelerators and to be beneficial to researchers in deep learning.

Keywords: FPGA, ASIC, Deep learning, Neural net

Proficient Dual Secure Multi Keyword Search by Top-k Ranking based on Synonym Index and DNN in Untrusted Cloud

Rosy Swami, Prodipto Das Department of Computer Science, Assam University, Silchar, Assam {dam.rosy, prodiptodas}@gmail.com

Corresponding Author: Rosy Swami dam.rosy@gmail.com

Abstract: Recent developments in cloud services have increased number of data owners to store their encrypted data in the cloud whereas equal or more data users participate to retrieve data. Secure retrieval of relevant data has become a challenging issue. In this paper, a secure ranking based multikeyword search using semantic index is being developed. Initially, owner builds an index file by semantic representation of keyword. Security key is provided by Trusted Authority (TA) for decrypting the obtained results at the user side. TA manages dual security processes such as managing secret keys and issuing security devices to the data users. User query reaches proxy server, and it checks whether any frequent keyword matches with given query using Boolean Search. If it does not match, query enters into the main server which stores all document and index files to obtain relevant result using Deep Learning Neural Network. In deep learning neural network, the query is processed with vector space model to retrieve the relevant documents. Finally, user decrypts the relevant results obtained from deep neural network. The experimental result shows that our proposed model provides better performance in terms of recall, ranking privacy, precision, searching time.

Keywords: Cloud Service Provider, Semantic Search, Secure, Multi-keyword Search, Trusted Authority.

Transfer learning based detection of COVID-19 using chest CT scan images

Aryaman Chand^{1*}, Khushi Chandani², Monika Arora³

²Amity University, Noida, Uttar Pradesh, India ²khushi.chandani.p@gmail.com

³Amity University, Noida, Uttar Pradesh, India ³maonika4dec@gmail.com

Corresponding Author: Aryaman Chand aryamanchand14@gmail.com

Abstract. The global pandemic caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus has had historical impact on the world. The virus causes severe respiratory problems and with an R0 of 5.7, spreads at a rapid rate. At the time of writing, there were over 85 million cases and 1.8 million deaths caused by COVID-19. In the proposed methodology, Deep Convolutional Neural Networks (DCNNs) have been trained, with the help of transfer learning, to learn to identify whether a suspected patient is suffering from this disease using their chest CT scan image. Transfer learning technique enables the transfer of knowledge from pre-trained models which have been previously trained on extremely large datasets. Various DCNN models have been applied such as AlexNet, ResNet-18, ResNet-34, ResNet-50, VGG-16, and VGG-19. The DCNNs were evaluated on a set of 2,481 chest CT scan images. Various performance metrics (Accuracy, MCC, Kappa, F1 score etc.) were calculated for all DCNN models to enable their comparative evaluation. After extensive testing, ResNet50 was found to give the best results in this binary classification task. The highest accuracy achieved was 97.37% and highest kappa was 0.947. Identification of presence of COVID-19 using this method would provide great benefit to society and mankind.

Keywords: Convolutional neural network, SARS-CoV-2, coronavirus, COVID- 19, Transfer learning

Flow-based Detection and Mitigation of Low-rate

DDoS attack in SDN Environment using Machine

Learning Techniques

K. Muthamil Sudar^{1*}, P.Deepalakshmi²

¹Department of Computer Science and Engineering, School of Computing, ¹Kalasalingam Academy of Research and Education, ¹Krishnankoil, Tamilnadu, India ¹k.muthamilsudar@klu.ac.in *

²Department of Computer Science and Engineering, School of Computing, ²Kalasalingam Academy of Research and Education, ²Krishnankoil, Tamilnadu, India ²deepa.kumar@klu.ac.in

Corresponding Author: K.Muthamil Sudar k.muthamilsudar@klu.ac.in

Abstract:

Software Defined Networks (SDN) has become more efficient and popular by separating the control from data plane devices. Centralized controller in the control plane acts as core part of SDN environment which makes the decision to handle traffic in data plane by analyzing the entire network. In addition, handling network attack is equivalently complex for controllers. Low-rate Distributed Denial of Service (LR-DDoS) attack is the most common in SDN environment. This attack restricts legitimate users to access resources by sending unwanted and half-opened request towards the devices in data plane. Hence, it is vital to detect and mitigate LR-DDoS attack in its early stage because nature of attack is very similar to original request. The nature of this attack exhausts the network resources and leads to resource unavailability or delay while processing the legitimate requests. In this paper, we propose a flow-based detection and mitigation framework using machine learning models like Support Vector Machine (SVM), C4.5 Decision tree and Naïve Bayes as classifiers to detect LR-DDoS attack. From every traffic flow samples, we extract the essential features to detect attack. In mitigation phase, we handle the attack flow information and install the mitigation rules to avoid LR-DDoS attack from same source. Our experimental results show that SVM mechanism achieves better accuracy compared to C4.5 and Naïve Bayes techniques.

Keywords – SDN, DDoS, Machine Learning, SVM, C4.5 Decision tree, Naïve Bayes.

Improving the Protection of Wireless Sensor Network using a Black Hole Optimization Algorithm (BHOA) on Best Feasible Node Capture Attack

Ankur Khare^{1*}, Rajendra Gupta², and Piyush Kumar Shukla³

¹Rabindranath Tagore University, Raisen, India khareankur94@gmail.com

²Rabindranath Tagore University, Raisen, India <u>rajendraguptal@yahoo.com</u>

³University Institute of Technology, RGPV, Bhopal, India pphdwss@gmail.com

Corresponding Author: Ankur Khare, khareankur94@gmail.com

Abstract. Wireless Sensor Network (WSN) is an area of research that connects mutually huge subareas of communication, routing, security and attacks. WSN is conceivably most susceptible network to node capture attack due to its dynamic nature in huge area. A node capture attack is introduced by seizing few nodes through an intruder to capture entire WSN by extracting the useful information like keys, routing mechanism and data from WSN. To improve the protection of WSN, we proposed a Black Hole Optimization Algorithm (BHOA) on best feasible node capture attack to discover the optimal nodes having superior possibility of attack. The BHOA is applied on a function Vertex Participation. The experiment is performed on MATLAB 2019a environment and the results show the better quality, efficiency of BHOA against MA, OGA, MREA, GA and FFOA based on traffic compromised ratio, power consumption cost, and attacking time.

Keywords: Black Hole, Compromised, Feasible, Seizing, Wireless Sensor Network (WSN).

A Systematic Analysis of the Human Activity Recognition Systems for Video Surveillance

Sonika Jindal^{1*}, Monika Sachdeva², and Alok Kumar Singh Kushwaha³

^{1,2}Department of Computer Science & Engineering, IKG Punjab Technical University, Jalandhar, India ¹sonikajindal@sbsstc.ac.in, ²monika@ptu.ac.in

³Department of Computer Science & Engineering, Guru GhasidasVishwavidyalaya, Bilaspur, India <u>alokkumarsingh.jk@gmail.com</u>

Corresponding Author: Sonika Jindal (sonikajindal@sbsstc.ac.in)*

Abstract. In recent years, human activity recognition has become a prominent research area in numerous fields such as healthcare, smart home activity analysis, suspicious activity recognition, robotics, surveillance, and security. The focus of the current research work is the analysis of human activity recognition systems for video surveillance. The human activity recognition system involves the detection of normal as well as abnormal activities. The recognition of human activities is still considered a challenging issue despite the contributions of numerous researchers. The erratic human behaviour and complexities of the video datasets create numerous challenges to precisely observe the human activities with significant performance. The analysis of the human activity detection systems for video surveillance is conducted on the basis of state-of-art contributions by different researchers in the field. The paper also describes the taxonomy of human activity detection. It ends with a discussion of the challenging issues in the field along with the concluding remarks.

Keywords: Human Activity Recognition, Video Surveillance, Security Surveillance, Human Computer Interaction, Visual Surveillance.

Fault Tolerant Multimedia Caching Strategy for Information Centric Networking

Dharamendra Chouhan¹, Sachinkumar Hegde¹, Srinidhi N N², Shreyas J^{1*} and Dilip Kumar S M¹

¹Department of Computer Science and Engineering, University Visvesvaraya College of Engineering, Bangalore, India

²Department of CSE, Sri Krishna Institute of Technology, Bangalore, India <u>dharmu2007@gmail.com</u>, <u>hegdesachinkumar@gmail.com</u>, <u>joseph.shreyas3@gmail.com</u>, <u>dilipkumarsm@gmail.com</u>

Corresponding Author: [Shreyas J, E-mail: joseph.shreyas3@gmail.com]

Abstract. Extensive usage of mobile multimedia-based applications is increasing the user's demand on the internet. Edge computing makes it possible to bring storage of data and computation in close vicinity to mobile users. To improve the experience of the users, proposed method uses edge Internet of Things equipment-assisted Fault Tolerant Multimedia Caching Strategy (FTMCS) for information centric networking. To accomplish this, we propose a new technique composed of optimized task distribution and fault tolerant network services is used. Task distribution method efficiently distributes the downloading task among the edge nodes having required data. Fault tolerant service makes it possible for the network to withstand node failures which may occur during the file downloading and by using this service, fast and reliable transfer of content happens seamlessly according to user preferences. The experimental results show that the FTMCS provides better network performance compared to the existing solution in terms of download speed and throughput.

Keywords: Caching, Edge Computing, Task Distribution, Fault Tolerant, ICN, Internet of Things, Multimedia

Cloud-based Parkinson Disease Prediction System using Expanded Cat Swarm Optimization

RamaprabhaJayaram^{1*}, and Senthil Kumar T²

¹SRM Institute of Science & Technology, Kattankulathur, India ramapraj@srmist.edu.in

²SRM Institute of Science & Technology, Kattankulathur, India senthilt2@srmist.edu.in

Corresponding Author:RamaprabhaJayaram, ramapraj@srmist.edu.in

Abstract. Parkinson disease is identified as the second most severe neurodegenerative disorder that affects the nerves system of people. This disease could mainly affect the walking, speech and vision of patients followed by body nervousness, handwriting, harsh voice quality, depression and sleeping problems. The proposed research study focuses on early detection and diagnosis of disease from the accelerometer sensor-based data by evaluating the deviations present in patient's motor symptoms. A cloudbased Parkinson disease prediction system is developed for a clinical decision making process that helps the doctor to diagnose the Parkinson influenced patient from a remote place. Gait parameters of the patient were extracted along to provide input vectors to the classifier model for onboard Parkinson disease prediction and diagnosis. An effective expanded cat swarm optimization (ECSO) based feature selection technique is explored to overcome the pest of dataset dimensionality. It could select the most appropriate features from the patient dataset according to a logically inspired evolutionary algorithm. Using this feature selection technique in the k-Nearest Neighbor (k-NN) classifier model could significantly improve the disease prediction accuracy and also minimizes the disease prediction time against the existing classifier models.

Keywords: Parkinson Disease, Feature Selection, Cloud-based Prediction, Cat Swarm Optimization, k-Nearest Neighbor Classifier.

Quality Assisted Spectrum Allocation in Cognitive NOMA Networks

D. Prasanth Varma¹*, K. Annapurna¹

¹VFSTR, Vadlamudi, India Prasanthvarma28@gmail.com

²VFSTR, Vadlamudi, India arya.anu85@gmail.com

Corresponding Author: [D. Prasanth Varma] <u>Prasanthvarma28@gmail.com</u>

Abstract. Future communications are developed with new communication standards for multi access technologies, where Non-orthogonal multiple access (NOMA) and spectrum sharing are the two emerging approaches. To transfer the data from one end to another end through this wireless communication medium interference take place, which affects the overall performance of the system. To minimize the interference in these communications the efficient spectrum sharing technique was developed. Cooperative relaying in NOMA system with spectrum sharing using threshold modeling were proposed in past. To optimize the resource allocation in NOMA-cooperative relaying, instantaneous signal to noise ratio were used in obtaining higher outage throughput in a spectrum sharing cognitive radio-NOMA (CR-NOMA) system. In the previous methods constant thresholding is considered in the energy detection model and the quality of signaling is not observed, which results in lower throughput. In this work, a Quality Assisted Spectrum Allocation (QASA) based on loss probability is proposed and a dynamic threshold modeling is suggested for spectrum sensing under dynamic channel condition. Here the Rayleigh and Rician fading models are considered and used the Lagrange mathematical concept to calculate the bit error and to minimize the distortion. The throughput of the proposed work performs well when compared with the conventional method of Simultaneous wireless information and power transfer (SWIPT).

Keywords: Cognitive radio, NOMA, throughput, dynamic thresholding, Spectrum allocation.

A Hybridized Machine Learning model for Optimal Feature Selection and Attack Detection in Cloud SaaS Framework

Reddy Saisindhutheja^{1*}, Gopal K. Shyam¹

^{1*} School of Computing and IT, REVA University, Bengaluru, Karnataka-560 064, India Department of CSE, Sreenidhi Institute of Science & Technology, Hyderabad, Telangana-501301, India E-mail: <u>thejasindhu@gmail.com</u>

¹ School of Computing and IT, REVA University, Bengaluru, Karnataka-560 064, India E-mail: <u>gopalkrishnashyam@reva.edu.in</u>

Abstract. Cloud computing offers several profitable services as and when required to the customer, and so it is growing up as a forthcoming drift in the IT sector. Software-as-a-service (SaaS) is one of the outstanding and fastestgrowing fields in cloud computing history. It is a license to acquire cloud applications via the Internet. Out of all this curiosity, security is found as one of the key issues that delay the growth of SaaS. The motivation of this research work is to provide security for SaaS by handling massive amounts of data. At first, feature selection is accomplished by Oppositional Crow Search Algorithm (OCSA). These nominated features are sent for detecting the attacks via Deep Belief Network (DBN). The main objective is to introduce an innovative, secure framework for SaaS by performing attack detection when there is enormous traffic. The proposed and conventional models are evaluated using a benchmark dataset. Results prove that the proposed OCSA+DBN outperforms the other existing methods with respect to precision, sensitivity which are positive measures and False Positive Rate (FPR) and False Detection Rate (FDR); the negative measures. Moreover, the proposed work performs better with the existing works with a performance indicator of 3% for all the metrics.

Keywords: Cloud Computing, SaaS, Attack Detection, Crow Search Algorithm, Deep Belief Network.

English Master AMMU: Advanced Spoken English Chatbot

Gayathri A N^{1*} and Viji Rajendran V²

¹NSS College of Engineering, Palakkad, India gayathrian96@gmail.com

²NSS College of Engineering, Palakkad, India vijirajv@gmail.com

Corresponding Author: [Gayathri A N] gayathrian96@gmail.com

Abstract. Everyone needs to express their ideas, thoughts, and emotions. For a professional or a student, they have to express or communicate their thoughts effectively. To make communication effective, it is important to understand the English language. As English is an international language, all had to have fluent English-speaking skills. Making improvements in spoken English can be done in various ways. Talking to friends or family members in English, practicing phrases and sentences, etc are some of them. But most people feel some awkwardness talking in front of a crowd or even with friends. Here comes the helper Assistant, Miss AMMU Teacher. Miss AMMU Teacher is the advanced version of AMMU spoken English chatbot. In this work, a chatbot called AMMU, Automatic Mega-agent Managed User guide is built for helping this purpose. AMMU will communicate with the user and will help to improve the spoken English capability of users.

Keywords: Chatbot, DialogFlow, Integromat, Google Assistant, Bot.

Prediction of Chemical Contamination for Water Quality Assurance using ML-based Techniques

C. Kaleeswari¹ and K. Kuppusamy²

¹Dept. of Computational Logistics, Alagappa University, Tamilnadu, India. kaleeswarichinnakkaruppanalu@gmail.com

²Dept. of Computational Logistics, Alagappa University, Tamilnadu, India. <u>kkdiksamy@yahoo.com</u>

Abstract. Big Data is used in a spacious, distinct set of information that is continuously evolving estimates. Excessively vast array of tools that can be computed to reveal models, patterns, and relationships, exclusively linked to human attitudes and communication. Its applications are applied in a range of real-time applications such as agriculture, weather forecasting, healthcare and water resource management etc. Each Big Data research-oriented process can provide the outcome of the prediction or forecasting process. Analyzing the quality of water is still so important to a human being, because human beings are not live without water. Smart Cities have been growing in the recent period, but many rural development areas are not yet emerging and do not have a lot of facilities like a smart city and these areas are affected by the chemical contaminations like Arsenic, Cadmium and some heavy metals. In this Research work, Prediction of Chemical contamination for Water Quality Assurance using ML-based Techniques is proposed. This article offers a brief overview of Machine Learning Algorithms such as Decision Tree, Support Vector Machine, Random Forest, Naïve bayes, K-Nearest Neighbor. These algorithms are used for classification and prediction using datasets to analyze which one Algorithm provides the best Predicting Accuracy seen in this paper.

Keywords: Machine Learning. Prediction. Contamination. Classification. Water Quality Assurance.

A Novel Block Diagonalization Algorithm to Suppress Inter-User Interference in a Multi-User MIMO System

Harsha Gurdasani¹, A G Ananth², Thangadurai N³

¹JAIN (Deeemed -to -be University), Bangalore, India harshagurdasani@gmail.com

> ²NMAMIT, Nitte, Mangalore, India <u>antisro@gmail.com</u>

³ JAIN (Deeemed -to -be University), Bangalore, India mrgoldjain2015@gmail.com

Corresponding Author: Harsha Gurdasaniharshagurdasani@gmail.com

Abstract. Diversity in MIMO applications tends to ameliorate the architecture of system for compensation with upgraded hardware and software requirements. Single-user MIMO systems allow one user to be serviced per transmission interval. This maximizes the throughput of a single user, but its disadvantage is that it does not take advantage of multi-user diversity. Multiuser MIMO systems (MU-MIMO) have become the main technique for meeting the requirements. In MU-MIMO one of the biggest issues to deal with is eliminating co-channel interference. The block diagonalization (BD) is a linear precoding method used in broadcast channels of MU-MIMO, that has beeneffective in removing multi-user interference (MUI), but is not computationally efficient. To counter this, we have developed a novel optimization algorithm (Bacterial Foraging Optimization) and implemented it with variation in the number of users and modulation orders. This paper exhibits the improvement in the diversity and proves the efficiency of the proposed algorithm.

Keywords: BFO, Block Diagonalization, MIMO, MU, CSI.

Human Abnormal Activity Pattern Analysis in Diverse Background Surveillance Videos using SVM and ResNet50 model

S.Manjula^{1*}, K.Lakshmi¹

^{1,2} PeriyarManiammai Institute of Science and Technology,Thanjavur,Tamilnadu,India.

1<u>manjula_se@pmu.edu</u> 2<u>lakshmi@pmu.edu</u>

Corresponding Author: S.Manjula, manjula_se@pmu.edu

Abstract. Today, almost all the places are observed by surveillance cameras. The aim is to monitor the activities in and around, especially for abnormal activities. But it requires manual assistance to watch/monitor. However, Manual inspection is a monotonous job, that reflects on information lost. It shows the importance of an automatic abnormal activity detection system. Although, this is a challenging task because of overlaps in objects, illumination variation, clutter background, camera angle, presence of various activity, and posture variations. It manipulates the human actions in videos, hence, it's tough to recognize the abnormal actions. Therefore, this paper examines the performance of the classical SVM and ResNet50 model among four datasets. There are 'SAIAZ' (Students Activities InAcademic Zone) -Corridor, 'SAIAZ'- Open-space, Classroom-Violence from YouTube (cc), and Mixed-Background-Dataset (MBD). The 'SAIAZ' was created by student volunteers of our Institution. And MBD is a collection of selected frames from various videos. Abnormal actions like slapping, punching, kicking, running, fighting is commonly available in hese datasets. Here, MBD is assumed to adopt various real-world situations. The SVM achieved the classification accuracy of 85%, 92%, 60%, and 44% on SAIAZ-Corridor, SAIAZ-Openspace, Classroom-Violence, MBD respectively. The ResNet50 achieved the significant improvements in all the datasets.

Keywords: Abnormal Activity detection, Surveillance videos, *SVM* Classifier,*ResNet*50,Diverse background

IoT based healthcare system for patient monitoring

S.Saravanan^{1*}, M.Kalaiyarasi², K.Karunanithi³, S.Karthi⁴, S.Pragaspathy⁵, Kalyan Sagar Kadali⁶

> ¹B V Raju Institute of Technology, Narsapur, India Saravanan.s@bvrit.ac.in

^{2,4}V.S.B. Engineering College, Karur, India <u>mukalaiyarasi@gmail.com</u> <u>karthicse10@gmail.com</u>

³Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, Tamil Nadu, India k.karunanithiklu@gmail.com

> ⁵Vishnu Institute of Technology, Bhimavaram, India pathyeee@yahoo.co.in

⁶Shri Vishnu Engineering College for Women, Bhimavaram, India kalyansagar.k@gmail.com

Corresponding Author: M. Kalaiyarasi, V.S.B. Engineering College, mukalaiyarasi@gmail.com

Abstract. The Internet of Things gadgets can acquire and transmit the data straightforwardly with different gadgets through the cloud, giving a gigantic measure of data to be assembled, stored and investigated for data-analytics processes. The aim of this paper is to enhancing the patient's quality of life by accessing real time visibility of the patient's condition, through measuring the physiological parameters like systolic, diastolic, pulse rate and body temperature values. The key idea is to administer care to the patients by constantly monitoring the medical parameters include blood pressure, pulse rate and body temperature without the need for the patient to move from facility to facility for constant supervision of their health. Data gathered from the blood pressure sensor, temperature sensor is analyzed and stored in the cloud, which can be monitored by the caregivers of the patient from any location and respond appropriately, based on the alert received.

Keywords: Internet of Things, Healthcare System, Blood Pressure, Temperature, Arduino UNO.

Investigation of CNN-based Acoustic Modeling for Continuous Hindi Speech Recognition

Tripti Choudhary¹, Atul Bansal², Vishal Goyal³

GLA University, Mathura, India.

triptichoudhary06@gmail.com {atul.bansal,vishal.goyal}@gla.ac.in

Abstract. Recently, Convolutional Neural Network (CNN) gain more popularity over hybrid Deep Neural Network (DNN)- Hidden Markov Model (HMM) based acoustic models. CNN's has the ability to deal with speech signals it makes appropriate choice for the Automatic Speech Recognition (ASR) system. The sparse connectivity, weight sharing, and pooling allow CNN to handle a slight position shift in the frequency domain. This property helps to manage speaker and environment variations. CNN works well for speech recognition, but it was not appropriately examined for the Hindi speech recognition system. The activation functions and optimization techniques play a vital role in CNN to achieve high accuracy. In this work, we investigate the impact of various activation functions and optimization techniques in the Hindi-ASR system. All the experiments were performed on the Hindi speech dataset developed by TIFR, Mumbai, with the help of the Kaldi and Pytorch-Kaldi toolkit. The experiment results show that the ELU activation function with Rmsprop optimization techniques gives the best Word Error Rate (WER) 14.56%.

Keywords: Automatic Speech Recognition, GMM, FBANK, CNN.

Electric Vehicle Monitoring System Based on of Internet of Things (IoT) Technologies

Yogesh Mahadik^{1*}, Mohan Thakre², Sachin Kamble³

¹Government Polytechnic Malvan, MH, India yogimahaforu@gmail.com

²K. K. Wagh Institute of Engineering Education and Research, Nashik, India <u>mohanthakre@gmail.com</u>

> ³Government Polytechnic Malvan, MH, India <u>sachinkamble80@rediffmail.com</u>

Abstract. Electric vehicles (EVs) are emerging as a preferred way to reduce environmental concern's needs. Concern and energy insufficiency, and in the foreseeable term this pattern is expected to grow. However, this is the inadequate charging infrastructure is now a major barrier to the adoption of EVs. Deployment of this infrastructure is expected to maximize the adoption of EVs to promote community access. Connectivity between charging substations (CS) is therefore mandatory. Entertainment Real-time status of CSs can provide useful information, such as availability of charging provisions, reserves, and time to meet the SC. The purpose of this paper is to have a better solution related to EV charging mechanism leveraging the benefits of the Internet of Things (IoT) technologies. The IoT is a model that gives the present facilities a real-time worldwide communication view of the physical world employing the sensors and the transmitting networks. This article suggests a real-time server-based prediction of EV infrastructure.

Keywords: Charging Substations, Forecasting of System, EV Charging, Internet of Things

Sizing of wireless networks with Sensors for Smart Houses with coverage, capacity and Interference Restrictions

Jhonatan Fabricio Meza Cartagena¹, Deepa Jose^{2*}, J. S. Prasath³

Instituto Superior Tecnológico17 de Julio, Ibarra, Ecuador jmeza@ist17dejulio.edu.ec

² Department of ECE, KCG College of Technology, Chennai – 600097, TamilNadu, India <u>deepajose11@gmail.com</u>

³ Department of EIE, KCG College of Technology, Chennai – 600097, TamilNadu, India

> Corresponding Author: [Deepa Jose] <u>deepajose11@gmail.com</u>

Abstract. This research work proposes an effective solution for sizing in wireless networks supported by IEEE 802.15.4g, thus presenting the possibility of communicating networks with remote sensors in a completely transparent way for end devices, considering for this analysis restriction parameters such as the capacity, coverage and interference knowing that the field of application of Wireless Networks is recently emerging considerably gaining much popularity, which is increased as their features increase and new applications are discovered for them. This article has also included the application of a practical scenario, which demonstrates the communication of the devices remotely.

Keywords: Wireless Sensor Networks, ZigBee, IEEE 802.15.4g, HAN domestic area networks, Sizing

Cooperative Agent based Location Validation for Vehicular Clouds

Shailaja S. Mudengudi¹, Mahabaleshwar S.Kakkasageri²

¹Tontadarya College of Engineering, Gadag-582101, India <u>psmssm@gmail.com</u> ²Basaveshwar Engineering College, Bagalkot- 587102, India <u>mahabalesh_sk@yahoo.co.in</u>

Corresponding Author: Shailaja S. Mudengudi. Mail: psmssm@gmail.com

Abstract. The evolution of Intelligent Technology Systems (ITS) has made possible the designing of vehicles with more sophisticated computing, communicating, and sensing capabilities. Vehicular Cloud (VC) magnifies these capabilities by cost-effectively sharing their resources. Location information about a node plays a prime role in many VC services which are based on the location of the user node. In this paper, we present a cooperative agent based location verification framework for VC. Central Authority (CA) a trusted entity that coordinates the activities in VC, takes care of the location verification process with the help of special nodes known as verifier nodes. Verifier nodes are distributed in the network randomly and secretly. The presence of such nodes is known only to the CA, which makes it stronger in terms of security.

Keywords: Vehicular Cloud, Cloud Computing, Public Key Encryption, Software Agent.

Energy Conserving Techniques of Data Mining for Wireless Sensor Networks- A Review

PragatiPatilBedekar^{1*}, Atul D. Raut¹, Abhimanyu Dutonde²

¹Department of Computer Science and Engineering, Abha Gaikwad-Patil College of Engineering, Nagpur, India pragatimit@gmail.com

²Department of Information Technology, Jawaharlal Darda Institute of Engineering and Technology, Yavatmal, India <u>atuldraut@gmail.com</u>

³Department of Computer Science and Engineering, Abha Gaikwad-Patil College of Engineering, Nagpur, India abhimanyudutonde@gmail.com

Corresponding Author: PragatiPatilBedekarpragatimit@gmail.com

Abstract. Now a day the application of Data mining in many areas has been tremendously increased. Data management and its processing is becoming the active research area for research community. In this paper the major concern is to study and analyzed the impact of data mining techniques over wireless sensor networks, as the sensor nodes characteristics and its wireless nature are the primary concerns. The data generates at the huge volume and rate, which is variable in nature therefore it is very much essential to design and implement data mining techniques for WSN. This paper mainly focused on to the comprehensive survey of existing data mining techniques, wherein the various limitations and its probable solutions are highlighted in detailed. A transition of traditional mining techniques to newly introduced research is also analysed in this paper. Detailed working and description of compression algorithm has been stated in this paper.

Keywords: Data mining, Energy conservation, System efficiency, Wireless sensor network

E-FFTF: An Extended Framework for Flexible Fault Tolerance in Cloud

Moin Hasan^{1*}, Major Singh Goraya², and Tanya Garg³

¹Lovely Professional University, Phagwara, India moin.25676@lpu.co.in

²Sant Longowal Institute of Engineering and Technology, Sangrur, India mjrsingh@yahoo.com

³Thapar Institute of Engineering & Technology, Patiala, India tanya.garg@thapar.edu

> Corresponding Author: Moin Hasan <u>moin.25676@lpu.co.in</u>

Abstract. Fault tolerance provisioning is extremely important in cloud. Literature suggests that the existing frameworks are service provider centric. Being a pay-per-use model, fault tolerance in the cloud should be flexible with respect to the users' requirement. Our previously proposed framework FFTF (Flexible Fault Tolerance Framework) is further extended to E-FFTF in the present paper to provide user transparency in the selection of service category based on the task completion deadline and slack time. E-FFTF successfully establishes task execution price savings through flexible fault tolerance. E-FFTF is proved to be beneficial for both the cloud service providers and service users as per the obtained experimental results.

Keywords: Cloud computing, Fault tolerance, Flexible fault tolerance, Reliability, Service price saving

ESIT: An Enhanced Lightweight Algorithm for Secure Internet of Things

Manoja Kumar Nayak and Prasanta Kumar Swain*

Mharaja Sriram Chandra Bhanja Deo University, Baripada INDIA

mknayak752@gmail.com prasantanou@gmail.com

Abstract. With the increasing use of sensors and intelligent devices, Internet of Things (IoT) becomes an important area of research to establish a connectivity among connected devices. Traditional algorithms used for encryption are found to be highly complex and with higher number of rounds for encryption which is computationally expensive. Device communication in IoT required algorithms with less complexity for secure communication. This paper address the problem of security in IoT using an enhanced lightweight encryption and decryption algorithm called Enhanced Secure IoT (ESIT) of an image using shift (or) and bitwise binary modulo 2 (+2) operation for Secure data commu-nication. It is a block cipher of 64 bits that accepts a 64-bit key and uses Left shift () and (+2) function for encryption and right shift () and (+2) decryption. It is the normal bitwise left and right shift by re- moving the sequence of qbits from the left and right side respectively. The proposed work has been evaluated in terms of correlation, entropy, and image histogram. Experimental evaluation on four available images clearly demonstrate the merits of the proposed approach.

Keywords: IoT · Security · Encryption · Decryption

Selection of OLAP Materialized Cube by using a Fruit Fly Optimization (FFO) approach : A Multidimensional Data Model

Anjana Yadav^{1*} and Anand Tripathi²

¹P. K. University, Shivpuri, India yadavanjana3485@gmail.com

²P. K. University, Shivpuri, India <u>dr.aktripathi@gmail.com</u>

Corresponding Author: Anjana Yadav, yadavanjana3485@gmail.com

Abstract. The Online Analytical Processing (OLAP) based Multidimensional examination hassles for several stockpiling magnificence over huge data. For as much to recognize queries answering time companionable by OLAP framework users and understanding entire business perceive mandatory, OLAP data is structured as a data cube (a multidimensional model). The OLAP queries are responded in speedy and steady time by utilizing the cube materialization for assessments takers. But, this also involves unendurable expenses, regarding to stockpile memory and period, and as a data depot, OLAP has an average dimension and dimensionality which is to be significant on query processing. Consequently, cube assortment has got to be finished motivating to diminish inquiry management expenses, maintaining as a restraint the materializing gap. Several techniques and heuristics like deviationist and insatiable algorithms have been utilized to offer an estimated result. In this work, a Fruit Fly Optimization (FFO) approach is implemented in a lattice structure to obtain an optimal materialized data cube for reducing the query processing expenses. The results illustrate that FFO generates better performance than Particle Swarm Optimization (PSO) in terms of frequency and number of dimensions.

Keywords: Cube Materialization, Data Cube, Fruit Fly Optimization, OLAP, Multidimensional Model.

Automatic Attendance Management System using Face Detection and Face Recognition

Varsha M^{1*}, Chitra S Nair²

¹NSS College of Engineering, Palakkad, India varsham628@gmail.com

²NSS College of Engineering Palakkad, India chitranairis@gmail.com

Corresponding Author: [Varsha M] varsham628@gmail.com

Abstract. Attendance plays a major role in every education system. Taking attendance of students manually can be a great burden for teachers. It may cause many problems like loss of time, repetition, incorrect markings and difficulties in marking them. To avoid this there is a need to design an automatic system that overcomes the issues with the traditional attendance system. There are many automatic methods available for this purpose like finger-print systems, RFID systems, face recognition systems and iris recognition systems, etc. But among these Face Recognition proved to be more efficient. The main objective of this paper is to propose a model that captures images from videos, detect and recognize the faces, predict the recognized face and then mark attendance. In this work a basic step has been performed which uses fifteen classes from LFW Dataset and faces are detected, recognized and then prediction is done on a randomly selected image from the used dataset. This system uses a combination of Multi Task Cascaded Neural Network (MTCNN) algorithm along with Face Net that can be used to detect faces and extract facial features from images. SVM is used to predict the face of the person from the image. The proposed system obtains an accuracy of 99.177% for the training set and 100% on the test set. The accuracy, precision, recall, and F1-scoreare computed.

Keywords: Face Detection, Face Recognition, MTCNN, FaceNet, SVM

Integrating IoT With Blockchain: A Systematic Review

Malvinder Singh Bali^{1*}, Kamali Gupta¹, and Swati Malik²

¹Chitkara University Institute of Engineering and Technology, Chitkara University Rajpura/Patiala, India Kamali.singla@chitkara.edu.in

²Chitkara University Institute of Engineering and Technology, Chitkara UniversityRajpura/Patiala, India <u>swati.malik@chitkara.edu.in</u>

Corresponding Author: [Malvinder Singh Bali] ^{1*}Chitkara University Institute of Engineering and Technology, Chitkara University Rajpura/Patiala, India malvinder.singh@chitkara.edu.in

Abstract. With the advent of IoT, Internet dominance has been extended far and wide, resulting in management of billions of smart devices online. However, all the management frameworks in IoT developed so far are based on centralized models, which have their own set of issues like single point of failure and security constraints. To encounter major issues like this, Blockchain provides an effective alternative to encounter the issues of security and privacy. Blockchain being a distributed and decentralized ledger framework, when used with IoT helps to encounter a lot of security related constraints. In this paper, a detailed study related to Blockchain has been conducted and how well it works in collaboration with IoT to overcome all the major security and privacy issues in an IoT ecosystem. Many other applications of Blockchain in an IoT environment were also studied, with the intention of exploring all the potential benefits it can provide while working with IoT.

Keywords: Blockchain, Decentralization, Smart Contract, IoT

Performance Comparison of Adaptive Mobility Management Scheme with IEEE 802.11s to Handle Internet Traffic

Abhishek Majumder^{1*}, Sudipta Roy²

¹Department of Computer Science & Engineering Tripura Universiy, Suryamaninagar, Tripura, India <u>abhi2012@gmail.com</u>

²Department of Computer Science & Engineering Assam University, Silchar, Assam, India <u>sudipta.it@gmail.com</u>

Corresponding author: Abhishek Majumder abhi2012@gmail.com

Abstract. Wireless Mesh Network (WMN) is one type of mobile ad-hoc network. So, if there is a link breakage it can heal and reorganize the network by itself. Portals, Mesh Gates and Access Points, Stations (STAs) and external station (STA) are main components of WMN. Portals are used to connect the network to the internet. STAs are the nodes through which routing of packets take place. External STAs are the users of WMN. Mesh Gates and Access Points are the stations which route the packets and also act as Access Points for the external STAs. In case of WMN IEEE 802.11s is the standard. When the external STA moves in the WMN, it goes out of coverage of a Mesh Gate and Access Point and enters into the coverage of another one. Hybrid Wireless Mesh Protocol (HWMP), routing protocol of IEEE 802.11s, does not support external Station's (STA's) mobility. To integrate mobility Adaptive mobility management technique had been proposed. The scheme considers session and mobility activities of the external STA by taking into account its session to mobility ratio (SMR). Based on SMR value it makes the decision about transmission of route management packets. This paper presents numerical analysis of adaptive mobility management scheme and HWMP. Simulation of both techniques are carried out using NS-2. Performance comparison shows that adaptive mobility management scheme outperforms HWMP. Moreover, a comparison between the numerical analysis and simulation results have also been performed. It has been observed that results in case of HWMP are very close.

Keywords: Portal, Mesh station, Mesh gateway, IEEE 802.11s, External station.

RT-Gate: Concept of Micro Level Polarization in QCA

K. Bhagya Lakshmi^{1*}, D.Ajitha² and K.N.V.S. Vijaya Lakshmi³

¹Department of E.C.E, Sasi Institute of Technology and Engineering, Tadepalligudem, India bhagyaelectronics701@gmail.com

²Department of ECE, Sreenidhi Institute of Science and Technology, Hyderabad, India ajithad@sreenidhi.edu.in

³Department of E.C.E, Sri Vasavi Engineering College, Tadepalligudem, India vijayalakshmi.kakaraparthi@srivasaviengg.ac.in

CorrespondingAuthor: K. Bhagya Lakshmi, <u>bhagyaelectronics701@gmail.com</u>

Abstract: Quantum-dot Cellular Automata is an evaluation paradigm in which transistors are not used and viable candidate for replacing the CMOS based technology.QCA is one of the boosting nanotechnology devices with the aim to replace the CMOS technology. QCA is implemented by utilizing the tunneling of the electrons with the given potential within the quantum cell. We made an attempt to suggest a multiplexer architecture in QCA using micro-level polarization. The proposed multiplexer design saves **16.67%** of effective area compared to the best designs reported till date. In this paper, new designs of universal gates are proposed. The proposed NOR and NAND gates requires less number of quantum cells which results in less effective area compared to the conventional majority gate based designs. By using these micro-level polarized gates, the multiplexer which is proposed in this paper is implemented. The proposed multiplexer is designed and simulated by QCA Designer.

Keywords: Quantum-dot Cellular Automata (QCA), RT-Gate (Rotate T-Gate), Universal gates, Majority Voter Gate (MVG), 2x1Multiplexer, Operation cost (O-Cost).

An Interactive Smart Mirror using Internet of Things and Machine Learning

Keval B. Prajapati¹, Chintan Bhatt², Hakima Chaouchi³

¹ Charotar University of Science And Technology, Gujarat, India <u>16ce091@charusat.edu.in</u>
²Charotar University of Science And Technology, Gujarat, India <u>chintanbhatt.ce@charusat.ac.in</u>
³Télécom SudParis, Évry, France hakima.chaouchii@gmail.com

Abstract. With the large-scale improvements in communication technology and easy accessibility of the same has led to the advent of the IoT technology, which in turn has resulted in more, and more devices being IoT enabled. This research paper embarks a next generation smart mirror with the aim of connecting the conventional mirror into the IoT network along with a certain set of features, which were never introduced before. The whole range of features focuses on increasing the utility of daily mirrors. This mirror along with acting as a piece of glass will also be acting as a huge glass notepad upon which the user can leave any handwritten messages which are to be conveyed to others and can never go unnoticed. Keeping in mind the smudging effect and the fingerprint mark that are left behind when the mirror surface is touched, this new feature allows one to write the message on the mirror without touching the mirror surface itself. Additionally, the mirror will also support some of common features as well namely date, weather forecast, news headlines and daily remainders.

Keywords: OpenCV, object detection, object tracking, camera, neural networks, python

An analytical approach for traffic grooming problems using waiting probability in WDM Networks

Priyanka Kaushal^a, Neeraj Mohan^{b*}, Surbhi Gupta^c, Seifedine Kadry^d

^aChandigarh Engineering College, Landran, India ^bI.K.G.P.T.U. Kapurthala, India ^cGRIET, Hyderabad ^dBeirut Arab University, Beirut, Lebanon

*Corresponding Author: erneerajmohan@gmail.com

Abstract: Traffic grooming is the optimization of resources in a network. An efficient traffic grooming provides better resource utilization, enhanced performance at a lower cost. Traffic grooming has become very significant for all types of computer networks. As WDM(wavelength division multiplexing) networks are providing very high speed for a huge amount of data transfer, so traffic grooming is even more important for these networks. There are so many parameters that may be considered for traffic grooming. The waiting probability is one of the key parameters for traffic grooming. Waiting probability is a measurement of time spent by a call to get the required resources for further communication. We have proposed an efficient traffic grooming technique. This technique is based on waiting probability calculations. Waiting probability is calculated and then traffic grooming problems are addressed based on the waiting probability calculations. Some of the other key network performance parameters such as the number of servers required, ideal path length for a source-destination pair, number of free wavelengths required, etc. are also analyzed. It is a low complexity technique for handling traffic grooming problems efficiently in telecommunication and call center management.

Keywords: Traffic Grooming, Waiting Probability, WDM Networks, Network Optimization





Gokaraju Rangaraju Institute of Engineering and Technology (Autonomous)

Nizampet Road, Bachupally, Kukatpally Hyderabad- 500090, Telangana State, India.

www.griet.ac.in | info@griet.ac.in