Lecture Notes in Networks and Systems

EDITORS:
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International Conference on Innovative Computing And Communication

Proceeding Of ICICC - 2018

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ICICC-2018

5-6th May 2018

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Organized by

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Schedule

ICICC-2018

International Conference on Innovative Computing and communication (ICICC-2018) 5th-6th MAY 2018

Guru Nanak Institute of Management, Punjabi Bagh, Delhi, India

Date	Time	Event
05.05.2018	8:00 A.M. - 9:00 A.M.	Registration
	9:00 A.M. - 9:30 A.M.	Inauguration
	9:30 A.M. - 10:15 A.M.	Key Note Speaker (1) : Prof. Sanjay Misra, Convenant University, Nigeria
	10:15 A.M. - 11:00 A.M.	Key Note Speaker (2) : Prof. Krishna Dev Kumar, Ryerson University, Canada
	11:00 A.M. - 11:15 A.M.	Tea
	11:15 A.M. - 12:00 P.M.	Key Note Speaker (3) : Mr. Aninda Bose, Senior Editor (Springer), India
	12:00 P.M. - 12:45 P.M.	Key Note Speaker (4) : Dr. D. Jude Hemanth, Karunya University, India
	1:00 P.M. - 1:30 P.M.	Lunch
	1:30 P.M. - 4:30 P.M.	Technical Session -1 (NETWORKS)
	1:30 P.M. - 4:30 P.M.	Technical Session -2 (CRYPTOGRAPHY & SECURITY)
	1:30 P.M. - 4:30 P.M.	Technical Session -3 (MACHINE LEARNING)
	1:30 P.M. - 4:30 P.M.	Technical Session -4 (DATA MINING)
	1:30 P.M. - 4:30 P.M.	Technical Session -5 (SOFT COMPUTING ,BIG DATA,CLOUD COMPUTING)
	4:30 P.M. - 4:45 P.M.	Tea
	4:45 P.M. - 5:15 P.M.	Cultural Event
	8:30 A.M. - 9:30 A.M.	Registration
	9:30 A.M. - 10:15 A.M.	Key Note Speaker (5): Dr. Siddhartha Bhattacharyya, RCIIT, Kolkata, India
	10:15 AM.- 11:00 AM	Key Note Speaker (6): Dr. Nilanjan Dey, Techno India College of Technology, Kolkata, India

06.05.2018	11:00 A.M. - 11:15 A.M.	Tea
	11:15 AM.- 12:00 PM	Key Note Speaker (7): Dr. Indrajit Pan, RCCIT, Kolakata, India
	12:00 PM.- 12:45 PM	Key Note Speaker (8): Dr. Nasib Singh Gill, MDU, Rohtak, India
	1:00 P.M. - 1:30 P.M.	Lunch
	1:30 P.M. - 4:30 P.M.	Technical Session -6 (NETWORKS)
	1:30 P.M. - 4:30 P.M.	Technical Session -7 (CRYPTOGRAPHY & SECURITY)
	1:30 P.M. - 4:30 P.M.	Technical Session -8(MACHINE LEARNING)
	1:30 P.M. - 4:30 P.M.	Technical Session -9(DATA MINING)
	1:30 P.M. - 4:30 P.M.	Technical Session -10 (SOFT COMPUTING ,BIG DATA,CLOUD COMPUTING)
	4:30 P.M. - 4:45 P.M.	Tea

PAPER PRSENTATION SCHEDULE ON 5th & 6th MAY 2018

Date	Time	Track Session and Paper IDS
05.05.2018	1:30 P.M. - 4:30 P.M.	Track Session - 1 (T1): Paper IDs : **15,46,77,84,121,115,157,172,162,175,224,254,257,296**
		Track Session - 2 (T2): Paper IDs : **22,24,27,86,283,460**
		Track Session - 3 (T3): Paper IDs : **12,41,114,161,164,295,297,304,311,320**
		Track Session - 4 (T4): Paper IDs : **29,51,105,122,130,174,182,185,187,267,301,452**
		Track Session -5 (T5): Paper IDs : **116,133,155,183,244,255,268,272,317**
06.05.2018	1:30 P.M. - 4:30 P.M.	Track Session - 6 (T6): Paper IDs : **321,335,375,395,398,399,405,408,409,413,425**
		Track Session - 7 (T7): Paper IDs : **288,336,355,370,380,393**
		Track Session - 8 (T8): Paper IDs : **328,350,368,373,382,388,428,444,468**
		Track Session - 9 (T9): Paper IDs : **322,419,420,426,432,461**
		Track Session - 10 (T10): Paper IDs : **330,358,362,369,402,410,418,439**

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Message from Organizer

ICICC-2018

International Conference on Innovative Computing and Communications

Web: icicc-conf.com, Email: icicc.conf@gmail.com

Date: April 30, 2018

On behalf of the organizing committee of International Conference on Innovative Computing and Communication (ICICC-2018), we extend warm welcome to the management of the institute, keynote speakers, our panelists, delegates, paper presenters and participants of this conference. The presence of our dignitaries on the dias during the two day conference is a further testimony to our sincere pursuits to achieve nothing less than the 'best', who have long trails of success behind them.

International Conference on Innovative Computing and Communication (ICICC-2018) is organized with the objective of bringing together innovative scientists, professors, research scholars, students and industrial experts in the field of Computing and Communication to a common forum. The primary goal of the conference is to promote the exchange of innovative scientific information between researchers, developers, engineers, students, and practitioners. Another goal is to promote the transformation of fundamental research into institutional and industrialized research and to convert applied exploration into real time application.

We seek your support and good wishes for this two day conference to be a grand success. We thank our sponsors and publishing partners for their support in the organizing of this conference.

Warm Regards,

Dr. Deepak Gupta
Organizer and Convener

Dr. Ashish Khanna
Organizer and Convener

Table of Content

PART-A: NETWORKS

Session Chair(s):

Prof. Abhishek Swaroop, Mr. Nihar Ranjan Roy, and
Dr. Jaspreet Singh

Designing an Intelligent Jammer for Targeted 802.11b/g/n Based Network Devices

Swastik Binjola[1], Aayushi Agrawal[1], Suraj Rawat[1], Ms. Preeti Nagrath[1]
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Abstract: Jamming of a wireless network can be achieved by generating high power noise in the proximity of wireless network. This approach to achieve jamming is not effective, efficient and have high probability of detection. We study and compare the performance and efficiency of currently available jammer for 802.11 based network devices. We find that jamming devices are not efficient and also does not address the targeted jamming. We purpose a design for a jammer using raspberry pi 3 with the help of a python script will address the problem of targeted jamming. By targeted here we mean that to get the main node from the topology of network and jam it. Furthermore, we show that the jammer is efficient and cost less than other conventional jammers. Finally, we discuss how the script and process of jamming can be improved to increase its efficiency and reduce the overall cost of operation

Keywords: Wireless networks, Jamming, 802.11, raspberry pi3, Link state packet, Wireless Local Area Network.

IOT Based Smart Museum Using Wearable Device

V.D.Ambeth Kumar[1], G.Saranya[1], D.Elangovan[1], V.Rahul Chiranjeevi[1]
V.D.Ashok Kumar[2]
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Abstract: As the evolution of technology has been wide spread in various fields, but in the recent past it has sustain-ably focused on advancing the standards of living environment into a much smarter way. An innovative period, where Internet of Things (IOT) has been globally accepted and being introduced in various environmental scenarios, transforming them into a smarter environment. IOT architects the smart environment in such a way that the users do not feel the absence of the regular intercultural and interactive experiences. The environmental scenario of a public exhibition considers people who are more self-involved in their own activities rather than paying attention to it and in other cases, people who pay attention carving for extracting more information from the public exhibitions. In this paper, we plan an indoor area mindful design which enhances the client involvement in a public exhibition. It gives rise to an environment where the entire system depends on a wearable device which provides the users with the subjective content of the observed entity through the combination of image recognition and localization capabilities. A few area mindful administrations running in the framework follow the user's movements while updating the environmental status. These services interact with the users through the physical devices. This system provides the possibility of

the extension to the several other IOT technologies, which advances the system's effectiveness in any public exhibition environment.

Keywords: Museum, IOT, SURF, SIFT, Bluetooth Low Energy, Artwork.

A Survey on Cross-Layer Design Approach for Secure Wireless Sensor Networks

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[2]Assistant Professor, College of Engineering, Guindy, Anna University, Chennai
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Abstract: Wireless Sensor networks comprised of several sensor nodes which are connected to one another with the limitations in computational capacity, battery life, energy resources and memory. Since the traditional layered approach was adequate for an only wired network, it operates within the boundary which leads to more energy consumption and more communication traffic that impact on overall lifetime and network performance of system architecture. Cross-layer design approach has been introduced to overcome these limitations by allowing the direct interactions between non-adjacent layers and can be applied to bring the optimum energy consumption in wireless sensor networks. In this survey paper, the working scenarios of cross-layer design in wireless sensor networks have been discussed and several cross-layer proposals have been reviewed.

Keywords: Cross-layer design, Wireless sensor networks, Energy efficiency, Protocol stack, Optimization Agent, Communication protocol, Routing protocols, Quality of Service, Network Lifetime, End-to-End delay.

CONSUMER BEHAVIOUR TOWARDS MOBILE PHONE HANDSETS

Suman Jain[1], Balgopal Singh[2]
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ABSTRACT: In the era of Networks, Every customer has some different perspectives to buy a mobile phone. The aim of this paper is to discover different reasons to buy mobile phones, factors which impact individuals in acquiring mobile phones and which factors propel customers in selecting their mobile phone handset. Secondly, buying behavior of different customers is impacted by different characteristics of consumers mind. This study employed quantitative research method using survey method. With convenient sampling technique, a structured questionnaire from 500 respondents was used to collect data. SPSS (Statistical Package for the

Social Sciences) was used to process the data; the data is presented by using various graphs and charts. The chi-square test was also used to determine the association between the various variables. By using the methods which are used in this study, marketers can help themselves in better decision and allocation of resources available.

Keywords: Networks, Mobile Phones, Consumers, Buyer Behaviour, Quantitative Research, Questionnaire, SPSS, Chi-Square.

A Decentralized Self Detection Mechanism to defend Selfish Behavior in Spray and Wait protocol

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Abstract: A class of networks providing wireless services that presents a promising solution to address technical issues in regions where at the time of transmission, an end-to-end path doesn't exist betwixt the sender and the receiver. In such networks, a node misbehaves by dropping packets or not forwarding the packets of other nodes even when it has sufficient buffer. The nodes showing this kind of behavior are termed as selfish nodes. These nodes are unwilling to use their own resources (i.e. buffer and power) when they forward the packets of other nodes. Selfish nodes reduce packet delivery ratio and waste system resources, i.e. bandwidth and power, which in turn increases the overhead. In this paper, we present a reputation based approach that helps to remit the selfish behavior of the network nodes. According to the simulation results, mitigation of selfish nodes leads to high delivery probability and lower overhead ratio.

Keywords: Selfish, Delay tolerant networks, Trust worthiness based strategy, Security, Delivery probability, Overhead ratio

Multithreaded Query processing using Quadtree

Debashis Das Chakladar, Debadrita Panda

Abstract: Nowadays every database has a large size whether it is static or dynamic, so finding a specific record from that large database is quite challenging. In this paper, an efficient multithreaded query processing algorithm has been implemented using the quadtree. We have proposed an efficient query processing algorithm using parallel computing which can reduce the query processing time. In each level of the quadtree, we computed the probability of that node and based on confidence interval we proceed further in the lower level. We have also analyzed the execution time of user-defined REGION query for the different number of data points and identified the

performance of our algorithm. The computational complexity of the query processing has been performed and both the time and space complexity is linear with respect to the input data points which are quite optimistic.

Key words: Parallel computing; Quadtree; Multithreading; Confidence interval.

AUTOMATED TRASHCAN

Anuj Gupta[1], Ankit Gupta[1], Abhishek[1], Ayushi Goel[1], Dr. Inderjeet Kaur[1]
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Abstract: Waste having a negative impact on public health, environment, and economy leading to an urgent need for moving to more sustainable Solid Waste Management System. So, this paper gives an attempt for improving the existing Solid Waste Management System of Municipal Corporations, using the Internet of Things (IoT). This paper approaches the building of an Automatic Trashcan, which will regularly; update its status to the Municipality so that the garbage will be cleaned earlier to the overflow stage. If the level reaches the threshold value, an automatic message will be sent to the municipality and the municipal worker which is nearest to the bin at that point of time. In addition, the trashcan will have an automatic waste separation system, which can separate the mixed municipal waste into certain categories like metal waste, dry and wet waste.

Keywords: Automation, IOT, Trashcan, Overflow Detection, Waste Segregation, Metal Sensing, Ultrasonic Sensors, Dry/Wet Waste, Capacitive Sensors.

LP-ACO Technique for Link Stability in VANETs

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[1]Research Scholar,
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Gharuan, Mohali

Abstract: The vehicular ad hoc networks consist of vehicles acting as nodes that conveying one another to exchange data mostly regarding road and traffic conditions. These vehicles move at higher speeds in contrast to the nodes in mobile ad hoc networks. Since information flowing in network is more of sensitive nature, the reliability of the data transmission becomes most important. These nodes use multi hop communication to forward the traffic among each other. Therefore, stability of the links is of prime importance while data transmission using multi hop communication. This was achieved by using Leapfrog algorithm, which helps to maintain the links between the intermediate nodes by choosing their common shortest neighbour. The capability of the network was compared depend upon routing overhead, packet delivery ratio and throughput. These parameters have shown to outperform the existing Ant Colony Optimization technique used for routing.

Keywords: VANETs, Leapfrog, throughput, overhead, ACO, AODV, DSR.

Improvement of lifespan of Ad hoc network with Congestion Control and Magnetic resonance concept

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Abstract: In versatile specially appointed systems, congestion happens with restricted assets. The standard TCP blockage control instructions can't deal with the unique properties of a common remote channel. TCP blockage control works extremely well on the Internet. As it turned out, the incomprehensibly contrasting condition in a versatile specially appointed system is exceedingly hazardous for standard TCP. Many methodologies have been proposed to conquer these troubles. Versatile operator based blockage control Technique is proposed to maintain a strategic distance from blockage in specially appointed system. When portable operator goes into the system, the choice of it is that nodes which are less-stacked and for the same it refreshes the directing table as congestion status. With the help of above Power Efficient Congestion Control Algorithm (PECCA) save the power of the network and with another, wireless power transfer technique which recharge the portable nodes of the network so that lifespan of the network can't exhausted early. This manuscript shows the simulation result between AODV and Proposed Algorithm PECCA with different Parameter metrics.

Keywords: MANET, Ad hoc Network, TCP, Congestion, AODV

A Critical Review of Routing Protocols for Vehicular Ad-hoc Network (VANETs)

Neha Mittal[1], Ashima Singh[2]
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Abstract: A Vehicular Ad-hoc Network (VANETs) is a subclass of Mobile Ad-hoc Network (MANETs) which performs communication between the moving vehicles without any need for existing infrastructure. VANETs can support various safety applications such as road condition broadcast, collision avoidance, lane changing assistance, and an emergency warning to prevent the people killed in accidents. The main problem in the wireless ad-hoc network is routing, which is used to deliver the data packets efficiently. This paper presents a critical survey on the performance of various routing protocols under the real time scenarios, under the mobility generator tools, and the mobility models. Further, this paper shows the comparison table of the

papers surveyed for the Packet Delivery Ratio (PDR), Delay, Throughput, simulation tools, and scenarios used.

Keywords: Wireless ad-hoc network. QoS. Routing protocols. VanetMobiSim. MOVE. Mobility models.

STREET LIGHT ENERGY SAVER

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[2]Student, Department of Computer Science, MAIT, India
[3]Student, Department of Computer Science, MAIT, India

Abstract: Street Light Energy Saver, a work that focusses on the pressing issue of Energy Consumption worldwide, is built with the aim of decreasing the power usage of street lamps during the time with no sunlight when their requirement in certain areas is minimum. The aim is improving the efficiency by decreasing the illumination factor of lights. Roads, especially the one connecting to the residencies have minimum traffic at night hours and hence it is crucial to save upon the excess wastage of energy. It is often observed that most of the roads at isolated places are rarely visited after 12am. The traffic gets filtered past 10 pm and only few of vehicles pass through those roads. But the system in place is such that; whatsoever the traffic maybe or whatsoever is the hour during the night, the street lights are always switched on. With the increasing connectivity of the road and hence the skyrocketing energy consumption, it has become the need of the hour to preserve upon the precious source of energy. This, thus, can only be achieved through some system in hand which, to some extent, walks on the lines of conservation. The Street Light Energy Saver is one such initiative that envisages to achieve the goals. The work when deployed in places will have street lamps emitting 50% of the light when no vehicles are passing. This would be done by deploying IR Sensors in order to sense the traffic on the road, during a provided time of the night. The IR Sensors will send the signal to the microcontroller which would decide about illuminating the lights to a 100%. As soon as a single vehicle would pass, it would switch to 100% and then back to energy saver mode. This would reduce the energy consumptions by great margins.

Keywords—Energy Conservation, Arduino ATMega 2560, IR sensors, LED Lamps.

BioSenHealth 1.0: A Novel Internet of Medical Things (IoMT) Based Patient Health Monitoring System

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Abstract: 21st Century has marked developments in the area of Microelectronics, Sensors, Material Science, VLSI, Internet of Things and many others which has led to significant developments in area of Agriculture, Military, Medicine, Space, Industrial production and even day to day routine activities. Medical Technology among all these have seen drastic changes in terms of technology for patient's treatment. Intelligent Health Monitoring systems are regarded as the need of hour for accurate and responsive monitoring of patient's health in diverse situations like injured soldiers in battlefield action, pregnant women, heart patients, cancer patients etc. Current advancements in Biosensor technology have led to the development of various health monitoring systems but these systems have some limitations in terms of cost, accuracy and portability. The objective of this paper is to propose an Intelligent IoMT based Health Monitoring system i.e. BioSenHealth 1.0. BioSenHealth 1.0 is working prototype for monitoring real time vital statistics of patients in terms of Body Oxygen Level, Pulse Rate/Heart Rate and Body Temperature and sends the live data to doctors via thingspeak.com. The device is fully tested on 50+ live patients in various nursing homes cum hospitals and the accuracy measured is more than 90% as compared to existing health monitoring systems. BioSenHealth 1.0 showed significant improvements in terms of low cost, accuracy, portability, as well as fast response time in real time operations.

Keywords: Biosensors, Sensor Network, Health Monitoring systems, DS18B20, Pulse Sensor, Oximetry Sensor, IoT- Internet of Things, BioSenHealth 1.0, Internet of Medical Things (IoMT).

Analysis of Simulation Tools for Underwater Sensor Networks (UWSN)

Dr. Anand Nayyar[1], Dr. Valentine Emilia Balas[2]
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Abstract: With the advancements in sensor technology, lots of different sensors are deployed in varied environments like Agriculture, Manufacturing, Chemical, Environment, Military for sensing and gathering data. Recently, the deployment of specialized sensors in Oceans is gaining a rapid pace for oceanographic data collection, underwater pollution monitoring, aquatic life monitoring, assisted navigation and even underwater surveillance applications. Nowadays, various Unmanned Autonomous Vehicles (UAVs) are designed and developed equipped with smart sensors for exploration of underwater natural resources and can gather varied scientific data. Underwater Sensor Networks consists of lots of static and mobile nodes deployed at different depths working autonomously or either in cluster to sense the data and transmit the data back to Mobile Station or Anchor Node. Underwater Sensor Network research is highly expensive when real time sensors are deployed in oceans as because of complex network topology and efficient network protocols. This challenge demands the implementation of Simulation Environment which can depict the actual underwater conditions. As lots of UWSN network simulators are available,

but the selection of appropriate tool specialized for suitable research still remains a challenge for researchers. The aim of this paper is to provide in-depth analysis of various UWSN simulation tools along with the performance comparison and key features associated with it. This paper will assist all the researchers to get the best suitable tool and even open directions for what further can be developed to make simulators have more advanced features in accordance to the realtime underwater environments.

Keywords: Underwater, Underwater Sensor Networks (UWSN), Wireless Sensor Networks, Simulation, Routing Protocols, Underwater Networking, Acoustic Communications, Underwater Sensor Nodes, SUNSET, NS2, AQUASim, WOSS, DESERT.

Shortest Path Analysis on GeoSpatial Data using PgRouting Visualization of Shortest Path on Road Network

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Abstract: Geographic information systems (GIS) are becoming the most popular field in the recent years. A geographic information system (GIS) is an application or system which is designed for capture, storage, manipulation, analysis and presentation of spatial or geographic information. Geographic location is the key term or information for the geographical information without which the data can't be said to be spatial or geographical. The approach mentioned in this paper explores two famous problems i.e; GIS and graph theory algorithms to find out the shortest path between the two nodes. This paper explores the working of "Shortest Path Analyzer" plugin developed for QGIS [1][19] to find out the shortest path between two nodes (source and destination) in road network (geospatial data) using various algorithm approaches of PgRouting [2][3] extension of PostgreSQL [4] database. A detailed overview of this plugin is presented in this paper. PgRouting provides some methods by which the cost parameter of distance from the source node to the destination node can be calculated dynamically. In this research, various algorithms (provided in PgRouting) are implemented to calculate the best and an optimal shortest path between two nodes and the comparison of various shortest path algorithms [20] is made to calculate the shortest path with minimum cost. This paper is a comprehensive compilation of theory as well as an implementation of PgRouting library functions in the form of the plugin of QGIS in the spatial network analysis domain. This research is implementing a Geospatial database at the backend and PyQGIS plugin at the front end to calculate and to visualize the shortest path between two nodes of the road network using various combinations.

Keywords: PgRouting; QGIS; Shapefile; PostgreSQL; PostGIS; Bi-directional Dijkstra; Dijkstra; Astar.

Implementation of Mobile Robot Navigation Mechanism using FPGA: An Edge Detection based Approach

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Abstract: Guiding a mobile robot for culmination of assigned task within the imposed time has brought up a way for the study and envisions of navigation methods in indoor environment. The design prospective of the mobile service robots in this stream got attention and navigation mechanism are to be enhanced. In this paper, we came up with such robotic structure and developed navigational algorithm that would be helpful to serve people in a reticulation environment. This paper laser focuses on design of mobile robot control unit that uses ultrasonic array for sensing random maze environment viz. hospitals and actuate the stepper motor modules respectively to complete the service. As a part of the composition, we simulated this development in Vivado 14.4 environment using Verilog HDL programming and also synthesized on FPGA part xc7z010clg400-1 of zynq-7000 family by considering a random environment.

A complete study on the Security aspects of Wireless Sensor Networks

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ABSTRACT: The Wireless sensor network is an upgrade of the wireless network; all the nodes are connected in an adhoc basis. For any application based on the WSN (Wireless Sensor Network) security plays a major role. This paper talks about the complete study on the security aspects of the WSN. Initially the architecture of the WSN is discussed with all the five layers and the cross planes. The basic security goals are discussed under primary and secondary. Each and every layer is prone to some kind of attack. The various attacks in all the layers are explained in detail and the counter measure for the same are discussed. Finally the research area in the WSN is discussed for the future upgrades.

Keywords: Wireless sensor network, survey on the security of WSN, Study of WSN security, WSN attacks, classification of WSN attacks

K-means based method for clustering and validating Wireless Sensor Networks

Abdo Mahyoub Almajidi1 and V.P. Pawar

Abstract: This work is considered clustering problem in a wireless sensor network, where sensor nodes are artificially generated and randomly distributed over the range of the network. This sensor is tiny, a short distance in communication, limited in

storage space, and un-rechargeable battery. The task of this sensor is to sense the data from the area of being deployed. The clustering technique is employed to partition the area of the application into sub-areas; the distance based method is used to partition the sensors in WSN. In this paper, we propose K-means based method for clustering and validating grouping of sensor nodes by using external indices named Purity. The proposed method can solve the clustering problem in WSN by partitioning the provided artificial sensors set into sub-clusters and validate them. The simulation result show ability of proposed method in solving the power consumption by dividing the region of sensing and confirms that this method is suitable for large scale wireless networks.

Key words: Clustering, Validating, Sensor nodes, Wireless Sensor Network (WSN), K-means Algorithm.

End-to-End Message Authentication using CoAP Over IOT

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Abstract: Internet of things is a new innovative technology topic under a science fiction and imagination or virtual world associated by visualizing physical world. There are conjecture and cybernetic world still possible about it. This is a truly abundant terrain of fantasy and original ideas when the combination of real life and virtual life through IoT. The interconnection of embedded devices, sensors, actuators that can communicate the information from one to another (M2M) over internet and data exchange. The important challenge is faced in IoT is security which helps to secure the information though data exchanging and known as web of things (WoT). Moreover, to perform routing in 6LoWPAN network, RPL uses destination-oriented DAG (DODAG) between the different IPv6 nodes. We can also interface the CoAP and 6LoWPAN through RPL using UDP protocol for various constrained nodes in Contiki OS. In this paper we focus on the proposed project are CoAP (Constraint application protocol) that falls under a software component at application layer. The DTLS security based on LESS algorithm that is provided under the CoAP protocol and gives the unicast messages because DTLS not support multicast. The proposed solution to make a multicast message is distributing session key using key distribution centre. This is used to encrypt or decrypt the multicast message then design and improve the cryptography algorithm. We have implemented this proposed work on the Contiki Operating System with the framework using Cooja Simulator that is an erudite tool to make the work more efficient and optimized it.

Keywords: IoT (Internet of Things); CoAP (Constrained application protocol); DTLS; Internet Protocol Stack; Cooja.

Identifying Prominent Authors from Scientific Collaboration Multiplex Networks

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Abstract: In research, collaborative work is a prominent factor in scholarly productivity. Collaborative work means when two or more scientists work together on the same problem and author a research paper jointly. This arrangement of scientific collaboration forms a network in which authors are the nodes, and collaborative works among authors are the edges of the network. Sometimes collaboration may be of different types such as inter-disciplinary collaboration, corporate-academic collaboration and so on, which forms multiplex networks. A multiplex consists of multiple layers structure, and each layer indicates the different types of tie-ups or interaction among users. Investigation on such a network always attracts excellent attention among researchers. For example, centrality measures find the prominence of an author on a given network. Here, we measure the significance of authors in a multilayer or multiplex network using various centrality measurements. We present a comparative analysis of the result of most central nodes in multiplex networks with the aggregated networks. We compare the structural hole nodes with the highest value centrality nodes and conclude that the centralities are the key features to find the prominent authors in collaboration networks.

Keywords: multiplex networks, centrality, structural holes, social network, multi-layer networks, collaboration networks.

Potential Node Detection for Route Discovery in Mobile Ad Hoc Networks

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Abstract: In Mobile Adhoc Network (MANET), nodes are mobile and network is decentralized. In such network, routing and power consumption are the two main issues. Many routing protocols broadcast control packets to discover the route. But, broadcasting of unnecessary control packets may drain battery power and increases the packet overhead. To rectify this problem, this paper proposes a novel and dynamic algorithm called Potential Node Detection based AODV (PND-AODV). This proposed algorithm elects the potential nodes for forwarding the control packets. This potential node selection aids to restrict the number of nodes participate in the route discovery algorithm thereby minimizing control overhead and power consumption. The performance of PND-AODV algorithm compared and analysed over various performance metric with traditional AODV and Enhanced AODV (EAODV) using NS2 simulations. The simulation results reveal that the presented algorithm minimizes

the routing packet overhead, average end-to-end delay and power consumption without compromising throughput.

Keywords: MANET, potential node detection, AODV, routing, broadcast, packet overhead and NS2.

Flood Early Detection System Using Internet of Things and Artificial Neural Networks

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Abstract: Natural disasters like floods are becoming more and more devastating every year due to increase in rainfalls and other factors induced by climate changes. The losses due to flood can be greatly minimized by the effective early detection systems. There are many traditional wireless sensor network methods currently available for this. But this paper gives a detailed study of how the current trending field of information technology called internet of things is applied for an efficient implementation of the early warning flood detection systems. The paper describes how the flood can be predicted by extracting various parameters from the environment that contributes to the flood. A fully connected feed forward artificial neural network is used here for the prediction purpose for giving early warning and communicating it to the target users. In the experiment, an Internet of Things platform, Thingspeak is used for real-time visualization of the sensor data. The alerts are sent to the preconfigured email IDs and mobile numbers of the authorities and the communities without any delay.

Keywords: Disaster Management, Internet of things, Neural Networks, Raspberry Pi, Sensor Networks.

Spatiotemporal Ontology for understanding semantics in Change Patterns of Remote Sensing Images

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Abstract: This paper presents a spatiotemporal ontology to model the spatiotemporal changes that have happened in a particular spatial region. The ontology incorporates the various features of the image under study. The spatial and temporal aspects of the ontology are separately build and are analyzed to understand the change that has happened over the particular time interval. This ontology helps to infer the change

patterns in a semantic manner using SWRL rules and inferred axioms. By this attempt, the ontology helps in conceptualizing the domain knowledge, thereby reducing the semantic gap which exists between the lower level features and higher level understanding of the images.

Keywords: Spatiotemporal, Ontology, Change Patterns, Remote Sensing.

An Interaction based novel routing protocol for Opportunistic Network

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Abstract: OppNets (Opportunistic Networks) are derived from the combination of MANETs (Mobile Ad-hoc Networks) and DTNs (Delay Tolerant Networks). But there is no definite path present from sender to receiver. The links between nodes are often connectionless and intermittent. This paper aims at strengthening the PRoPHET (Probabilistic Routing Protocol using History of Encounters and Transitivity) protocol for OppNets by selecting most promising node on the basis of its interaction with other nodes. This work presents an Interaction based routing. The performance of our proposed routing is better than PRoPHET in aspects of delivery probability, no. of message dropped and overhead ratio.

Keywords: Opportunistic Networks (OppNets), PRoPHET, The Opportunistic Network Environment (ONE) simulator, DTNs (Delay Tolerant Networks).

Forest Fire Detection System Using IoT

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Abstract: Forest fire (wildfire) is one of the most dangerous hazards. Forest fire accidents are affecting the people, economy, and bio-diversity since hundreds of years ago as long as the forest is present. There are too many technologies which are used for predicting forest fires and reducing the losses. However, these techniques are not working efficiently. According to a survey, approximate 80% of losses occur in the world due to late detection of the fire. So to overcome this problem, we use the Internet of Things technology. This technology makes use of the internet, microcontrollers, and sensors for multiple uses. IoT provides real-time and latest information of the proximity area and current status of the forest fire.

Keywords: IoT, raspberry pi, GSM, sensors, real-time system, Data analytics.

A Solution for Successful Routing in Low-Mid Density Network using Updated Azimuthal Protocol

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Abstract: The field of Wireless Sensor Networks has witnessed an increasing traction among researchers in the erstwhile few decades. Since in large networks, sensors are not uniformly distributed thus a problem arises in low and medium density part of that large network which has a high probability of the packets getting stuck at a specific node due to the problem of local minima. Thus, this paper tries to solve the problem of unsuccessful routing in low-medium density networks by implementing updated form of Azimuthal routing protocol which removes the overhead of keeping the routing details and also ensures that the packets reach the sink and is not affected by the presence of holes which is normally the case in lower density network. This protocol has been compared with greedy protocol which shows that it exhibits excellent performance with around 98.78% of average successful ratio compared to 45.38% in case of greedy.

Keywords: Wireless Sensor Network, Geographical routing, Azimuthal routing protocol, Mobile Ad-hoc Network, Successful Routing Ratio.

PART-B: CRYPTOGRAPHY & SECURITY

Session Chair(s):

Ms. Preeti Nagrath, Dr. Rachna Jain, Dr. Ankur Saxena

Hardware Implementation of Public Key Cryptography for Small Scale Devices

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Abstract: With the increase in cyber-attacks and the world transition of nearly everything into digital format, there is an increasing need for safeguarding private information. This paper suggests a way to encrypt data by a combination of Exclusive OR (XOR) Encryption along with Hashing that overcomes the shortfalls of XOR encryption. The major task is to hide the American Standard Code for Information Interchange (ASCII) number of the user input so effectively, that could be retrieved back by the receiver easily yet remain complex for an intruder. One way to achieve this is by using a robust hashing procedure that does not have any collisions and still is complex enough for someone to guess easily. In the end, we discuss the security of such a system as well as the scale of required combinations to hack the system.

Keywords: Encryption, XOR, Hashing, Security, Public Key, Private Key, Lightweight Cryptography.

Proof of Participation: Implementation of Proof of Stake through Proof of Work

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Abstract: A new protocol for consensus in blockchain is proposed that builds upon the Proof-of-Stake by implementing it with Proof-of-Work mining architecture. The Proof-of-Participation protocol improves security and significantly reduces the computational resources needed to maintain the strict level of security. The key idea involves the stakeholders to opt-in as miners and verifies the generated hash through consensus of the majority. It flexibly allows any of the validators to participate in mining for an explicit share of the reward which can change dynamically.

Keywords: Bitcoin · Blockchain · Cryptocurrency · Proof-of-Work · Proof-of-Stake.

Unfolding the mystery of Ransomware

Sudipti Dhawan and Bhawna Narwal

Abstract: With the advancement of technology cyber criminals have found new ways of earning money among them Ransomware is most popular. Ransomware intrusively parses the data of organization or individual then locks it through encryption mechanisms then demands the user by forcing him to pay ransom in form of Bitcoin

to retrieve his/her data back. This paper attempts to present various aspects of ransomware, its emergence, historical insights and various routes that may be adopted by ransomware practitioners.

Keywords: Bitcoin, Cyber Threat, Ransomware, Security.

SECURITY ON CLOUD COMPUTING USING SPLIT ALGORITHM ALONG WITH CRYPTOGRAPHY AND STEGANOGRAPHY

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Abstract: One of the latest trends in IT sector is Cloud Computing. It provides services such as storage, databases, software, networking, and more, over the "cloud", i.e., Internet, or, in other words a network of servers.In today's time user keeps a high amount of data on cloud and even share a lot of data, and hence it is necessary to use security measures so that there is no threat to any of the user's data. To provide high level of security with the rapid advancement of internet many tools and techniques are being used. The objective of the paper is to increase security by using split algorithm for the transfer of data on cloud servers. In addition to employing split algorithm for more security the paper proposes the idea of encrypting the data and then using the technique of steganography followed by splitting the stego-image.

Keywords: cloud, cloud computing, cryptography, steganography, key, split algorithm, cover image, AES(Advanced encryption standard), LSB(lowest significant bit).

Recent Advances in Networks and Data Security Survey on Various Mobile Operating Systems

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Abstract: Mobile Operating system is considered as the backbone of a mobile device which is a collection of data and programs that manages all the hardware and enhances the effectiveness of the software running on a device. We compared three mobile operating systems on the basis of their market share, functionalities delivered and other features so as to determine which mobile operating system is most suitable for a user based on applications required by the customer.

Keywords: Android OS · Bada · Blackberry OS · iOS · Sailfish OS · Palm OS · Windows OS · Symbian OS.

A novel Cancelable Iris Recognition Approach

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Abstract: A new random projection approach for cancelable iris recognition is presented in this paper. Instead of using original iris features, a masked version of the features is generated through the random projection for enhancing the iris recognition privacy. The proposed framework for iris recognition includes iris localization, sector selection of the iris to avoid eyelids and eyelashes, normalization, segmentation of the normalized iris region into halves, selection of the upper half for further reduction of the effect of eyelids and eyelashes effects, feature extraction with Gabor filter, and finally random projection. This framework excludes the effect of eyelids and eyelashes, and masks the original Gabor features to increase the level of security. Matching is performed with a Hamming distance metric. The proposed framework achieves promising recognition rates of 99.67% and an Equal Error Rate of 0.58%.

Keywords: Iris recognition. Cancelable biometrics. Random projection. Template transform.

Resolving Conicts in Requirement Engineering through Agile Software Development: A Comparative Case Study

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Abstract: Nowadays the Requirement Engineering (RE) is prime concern for any type of project. Companies are frequently changing their technology to cope up with the latest trends in the market. Everyday clients also demand something newer, therefore, the conicts between clients and companies are increased. So their is an

urgent need for satisfying and providing a solution for rening those conicts and requirements. When the requirements are not well understood then the possibility of the project failure is much higher. Keeping the aforementioned points in to consideration, in this paper, the test cases and feasibility studies for resolving the conicts in RE are explored in the form of some standards. The companies are also having their own rules and regulations. If the companies are not following those laws then the risks like loss of reputation, brand damage can also occur and if rules of the community are not properly followed then in future the costly penalties also imposed over them. For the aforesaid reasons, RE is major task because this is the only phase when system is just arrived for creation, planning and management is going. If some rules and regulations of the outer bodies of the environment, and it is not fullled then changes can easily and in some small loss it can handle.

Keywords: Requirement Engineering, Requirement Conicts, Renement of requirements, Agile.

TRAX: Smart Mobile Application to Improve the Safety and Security of Automobile Vehicles

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Abstract: This paper explains the complete working of 'TRAX' whose main aim is to focus on the security of the people and to assist them in their journeys safely through the aid of technology. TRAX is the name of our proposed mobile application/device which is an amalgam of innovation and safety. It consists of a 'Sender' and a 'Receiver'. The sender is installed in the vehicle and receiver is with the person who is monitoring the vehicle. The communication between the two components is done through the concept of screen mirroring. The sender has an interface in the form of an app which has various hidden and visible features which provide various security features in just a single window. It keeps a hawk eye on the vehicle. Smartness and automatic functioning of TRAX make it one of a kind.

Keywords: Screen Mirroring, Communication, Save Our Souls (SOS) Devices, Tailgating, GPS System, Road Safety, Security.

Image Steganography using LSB Substitution Facilitated by Shared Password

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Abstract: Nowadays, security of data has become the most sought-after issue worldwide. It is necessary to secure data while passing from one entity to another. Image Steganography is an effective technique that enables the sender and receiver to exchange confidential information by embedding it in images. In this research paper, we have implemented a secure steganographic mechanism using a pre-shared password to fulfil the above requirements. This mechanism provides a greater level of security while maintaining the visual quality and size of the image. The proposed mechanism is implemented using MATLAB.

Keywords: Image, Steganography, Password, Secure, MATLAB.

A Collaborative Study of Intrusion Detection and Prevention Techniques in Cloud Computing

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Abstract: Cloud computing is emerging as a powerful solution to ever-growing storage and processing requirements of an organization and individual without the burden of owning and handling the physical devices. Security is one of the primary concern in Cloud computing for large-scale implementation. Intrusion Detection and Prevention (IDP) techniques can be applied to secure against intruders. In this paper, we have studied different IDP techniques comprehensively and analyzed their respective strengths and weaknesses on various parameters to provide security in Cloud computing. Hypervisor-based and Distributed IDS have shown promising security features in cloud computing environment in comparison to traditional IDP techniques.

Keywords: Cloud Computing; Intrusion Detection; IDS; Intrusion Prevention; IPS; IDPS; Security.

PentaPlicative Cipher Technique

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Abstract: The traditional cipher techniques employ use of limited keys for asymmetric and symmetric cryptography. Most of the encoding schemes use single key-function to encrypt the critical data before transmitting it over an insecure network. Increasing the number of keys and number of encryption functions increases the strength of a symmetric technique. This paper presents a symmetric key technique that uses five keys for encryption and decryption.

Keywords: Cryptography, Symmetric, Encryption, Decryption, Cipher.

A Hybrid Approach for Speckle Reduction in Ultrasound

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Abstract: Speckle noise content present in Ultrasound (US) images degrades the image contrast and makes image interpretation difficult. In this paper, a hybrid speckle reduction method has been proposed in which wavelet transform, 2D wiener filter, and morphological operations are combined. The proposed method reduces speckle noise efficiently and enhances the US image. A comparison of the proposed method is made by utilizing classical speckle reduction filters including combinations of Fourier and Homomorphic filters. For performance evaluation, we have used Mean Square Error (MSE) along with Peak Signal to Noise Ratio (PSNR) for determining image quality, Signal to Noise Ratio (SNR) and Normalized Absolute Error (NAE) techniques have been used for quantitative evaluation. Also, Structural Similarity Index Metric (SSIM) is used for qualitative evaluation of the US image. We have used synthetic as well as real US images in our proposed method for evaluation of performance.

Keywords: Speckle noise, Ultrasound images, Wavelet transformation, Wiener filter, Morphological operations, Spatial filters, Thresholding.

Homomorphic Cryptography and its applications in various domain

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Abstract: Homomorphic Encryption (HE) is an encryption technique where operations are performed on cipher text. This encryption method can be used in varieties of applications by using public key algorithms. For transferring data from one place to another, there are many encryption algorithms for securing the operations and storage of data, but they do not preserve privacy. HE is useful in various applications which performs the operations on encrypted data, which should provide the same results after calculations performed directly on the plain text. Nowadays, security of information and calculations to deal with the data of big business has expanded massively. In any case, a basic issue emerges when there is a necessity of registering on such encrypted information where protection is built up. This paper represents homomorphic cryptosystems for preserving security, properties and categories of homomorphic encryption. In addition to this, privacy preserving applications of homomorphic cryptosystems in the field of cloud computing, private

information retrieval and data aggregation in wireless sensor network are also presented.

Keywords: HE, Cryptosystem, Security and Privacy, Partially Homomorphic Encryption (PHE), Fully Homomorphic Encryption (FHE), cloud computing, RSA cryptosystem, Paillier algorithm, Data aggregation, WSN

PART-C: MACHINE LEARNING

Session Chair(s):
Mr. Amit Joshi, Dr. Namita Gupta

A Computational Study On Air Pollution Assessment Modeling

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Abstract: Air pollution is termed as, introducing of biological substances, particulate matter and chemicals to the atmosphere which causes damage to human beings and other living organisms, or cause harm to natural atmosphere or to built environment. The origin of air pollution is classified into anthropogenic and non-anthropogenic. India is one of the biggest emitters of atmospheric pollutants caused by the road transportation sector. Air pollution modeling describes mathematical theory to understand, or predict the way pollutants affect the atmosphere. Modeling is also used to evaluate the connection among sources of pollution and their effects and influence on ambient air quality. This paper aims to survey the various techniques used for the assessment of air pollutant emission modeling.

Keywords: Air pollution, Geographical Information System (GIS), Land Use Regression (LUR), Air quality modeling.

An Optimization Technique for Unsupervised Automatic Extractive Bug Report Summarization

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Abstract: Bug report summarization provides an outline of the present status of the bug to developers. The reason behind highlighting the solution of each reported bug is to bring up the most appropriate solution and important data to resolve the bug. This technique basically limits the amount of time that the developer spent in a bug report maintenance activity. The previous researches show that till date the bug report summaries are not up to the developer expectations and they still have to read the entire bug report. So, in order to overcome this downside, bug report summarization method is proposed in light of collection of comments instead of single comment. The informative and phraseness feature are extracted from the bug reports to generate the all possible subsets of summary. These summary subsets are evaluated by particle swam optimization (PSO) to achieve the best subset. This approach is compared with the existing Bug Report Classifier (BRC) and Email Classifier (EC). For all approaches the ROUGE score was calculated and compared with three human generated summaries of 10 bug reports of Rastkar dataset. It was observed that the summary subset evaluated by PSO was more effective and generated less redundant, noise reduction summary and covered all the important points of bug reports due to its semantic base analysis.

Keywords: Natural Language Processing; Feature Weighting; Summarization; Unsupervised; Bug Report; Particle Swarm Optimization; Similarity based Approach.

Stress Analysis Using Speech Signal

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Abstract. In the area of human-computer interaction number of methods has been developed. The recent popular theme is "Emotional Intelligence". For research our main target objective is to observe and analysis the effect of emotions on the performance of persons while performing the tasks. In this paper, we are imposing a new approach of stress detection and classification for students during the examination period. We used MFCC (Mel-frequency cepstral coefficients) for feature extraction and SVM (Support vector Machine)classifier for better performance. In this system three types of corpus have been tested and classified.
Support Vector Machine combines with the Rule base approach with Energy and Fundamental Frequency rules. Indian Dataset is created by 50 students, including male and female both. Testing of corpus proved that Native area, Nationality and living place effects on speech frequencies. At the end of result analysis, we can see that Indians normal speech frequency is nearby equal to the Mongolian angry frequency. And as per our target view, results show that emotions affects the performance at an average rate of 20 t0 30 %. That is if person with positive emotions, then his task will achieve 20 to 30 % better result with high speed and opposite to this person with negative emotions will move towards the failure or will get a reduced rate in his performance about the task. Accuracy of system achieved more than 90% for depressive stress and aggressive stress. The result proved that in the examination period performance of students increases in exited and decreases in a depressive state

Keywords: Classification, Emotion detection, MFCC, Stress, SVM, Performance Analyzer.

Meta Heuristic Techniques to Solve Resource Constrained Project Scheduling Problem

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Abstract. Scheduling is a foremost vital activity in a broadly most engineering fields; mostly Project Management and Operations Research. However, a more practical

approach towards solving a scheduling problem would be to consider the applied constraints at hand, such as resources available at hand and other constraints. One such type of scheduling problem is the Resource Constrained Project Scheduling Problem, abbreviated as RCPSP. The main objective of the RCPSP problem is to plan the project activities with optimal makespan keeping in view the fact that the availability of resources over the timespan of a project is limited. However, being a NP-Hard Combinatorial Optimization Problem exact methods have a problem with convergence as the problem size increases. In recent years, meta-heuristics have shown promising solutions to this problem. In this work, the usage of meta heuristics to solve this problem is highlighted with possible future directions.

Keywords: Resource Constrained Project Scheduling, Optimization, Meta heuristics, Swarm Intelligence.

Leaf identification using HOG, KNN and Neural Networks

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Abstract -The main objective of this paper is the identification of leaves by using the concepts of image processing. A dataset comprising of 1900 images of 18 leaf species has been used to train our machine. Three major steps- image preprocessing, feature extraction (using Histogram of Oriented Gradients(HOG)) and classification have been performed. The initial step includes grey scale conversion and representing the input image as a zero-one matrix. In the next step, 900 features have been extracted using HOG. The last step comprises of classification by two supervised learning methodologies K Nearest Neighbours and Backward and artificial neural networks have proved to be a better choice with an approximate accuracy of 97%.

Hand Gesture Recognition Using Convolutional Neural Network

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Abstract. Hand Gesture Recognition is an essential feature that is used for human interaction with electronic devices and computers easily. In this paper, a hand gesture recognition application is presented to recognize hand gestures using a webcam. The application uses Convolutional Neural Network (ConvNet) for learning and classifying the hand gestures. Contour formation takes place around the palm and Hue Saturation Values (HSV) are extracted from the hand for detection. The application classifies 8 hand gestures and provides an accuracy of 90.125%.

Keywords: Hand Gesture; Recognition; ConvNet; HSV; Max Pooling.

Arrhenius Artificial Bee Colony Algorithm

Sandeep Kumar, Anand Nayyar and Rajani Kumari

Abstract: The foraging behaviour of real honey bees inspired D. Karaboga to develop an algorithm namely Artificial Bee Colony (ABC) Algorithm. The ABC performs well in comparison to other swarm based algorithms but has few drawbacks also. Similar to other stochastic techniques the step size during position update play very imperative part in the potential of ABC. The ABC is very good in exploration of search space but not fine in exploitation. So as to improve balancing between diversification and intensification process of ABC algorithm a novel variation of ABC proposed termed as Arrhenius ABC (aABC) algorithm. The suggested algorithm tested over eight unconstrained global optimization functions and two constrained problems. Results prove that aABC algorithm perform better for considered low dimensional problems in comparison to basic ABC and its current variants.

Key words: Swarm Intelligence; Nature Inspired Algorithm; Computational Intelligence; Exploration and Exploitation.

Rumor Detection using Machine Learning Techniques on Social Media

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Abstract. Information overload on Web has been a well-identified challenge which has amplified with the advent of social web. Good, bad, true, false, useful, useless all kinds of information disseminates through the social web platforms. It becomes exceedingly imperative to resolve rumors and inhibit them from spreading among the Internet users as it can jeopardize the wellbeing of the citizens. Rumor is defined as an unverified statement initiating from a single or multiple sources and eventually proliferates across metanetworks. The task for rumor detection intends to identify & classify a rumor either as true (factual), false (nonfactual) or unresolved. This can immensely benefit the society by preventing the spreading of such incorrect and inaccurate information pro-actively. This paper is a primer on rumor detection on social media which presents the basic terminology & types of rumors and the generic process of rumor detection. A state-of-art depicting the use of machine learning (ML) algorithms for rumor detection on social media is presented. The key intent is to offer a stance to the amount and type work conducted in the area of ML-based rumor detection on social media, to identify the research gaps within the domain.

Keywords: Rumor, Machine learning, social media

Empirical Analysis of Supervised Machine Learning Techniques for Cyberbullying Detection

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Abstract. Cyberbullying is utilization of digital technology for targeting a person or a group in order to bully them socially and psychologically. Real time social media platforms such as Instagram, Twitter and YouTube have large viewership, which serve as a fertile medium for such bullying activities. Instances of such harassment or intimidation are maximally found in the comments of a dynamic and an expressive medium like YouTube. This necessitates an adequate requisite to take relevant steps to find solutions for the detection and prevention of cyberbullying. The work presented in this paper focuses on the implementation of four supervised machine-learning methodologies namely Random Forest, K-Nearest Neighbour, Sequential Machine Optimization and Naive Bayes in order to identify and detect the presence or absence of cyberbullying in YouTube video comments. The experimentation was carried expending the Weka toolkit and utilizing the data gathered from comments obtained from YouTube videos involving core sensitive topics like race, culture, gender, sexuality, physical attributes. The results are analysed based on the measures like precision, accuracy, recall and fscore and amongst the four techniques implemented, K-Nearest Neighbour is able to recognize the true positives with highest accuracy of around 83%. We also discuss various future research prospects for detection of cyberbullying.

Keywords: Cyberbullying, Social Media, Supervised Machine Learning, YouTube

Primary Healthcare using Artificial Intelligence

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Abstract. The right to proper, basic and timely medical attention lies with every individual. Whereas the population of rural India (70%) have been devoid of it since a long time. Some factors causing these problems are poor financial conditions to afford the facilities, lack of means of transportation to reach these services, etc.Our proposed system emphasizes on providing instant help to remote patients. The person who needs medical attention sends a voice message to the system explaining the health condition. The voice message is converted to text message. The system evaluates prescription using Artificial Neural Network. The prescribed medicines are sent to patient in the form of a text message. Our system is efficiently trained for most of the prominent diseases, which prescribes precise medicines within milliseconds excluding

communication delay. It is a system, which analyzes the symptoms and can enhance the current medical situation by approximately 20% per year.

Keywords: Primary Healthcare, Natural Language Tool Kit, Artificial Neural Network, Back Propogation algorithm.

A Brief Survey on Random Forest Ensembles in Classification Model

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Abstract: Machine Learning have got the popularity in recent times. Apart from machine learning the decision tree is one of the most sought out algorithms to classify or predict future instances with already trained data set. Random Forest is an extended version of decision tree which can predict the future instances with multiple classifiers rather than single classifier to reach accuracy and correctness of the prediction. The performances of the Random Forest model is reconnoitered and vary with other models of classification which yield institutionalization, regularization, connection, high penchant change and highlight choice on the learning models. We incorporate principled projection strategies which are aiding to predict the future values. Ensemble techniques are machine learning techniques where more than one learners are constructed for given task. The ultimate aim of ensemble methods is to find high accuracy with greater performance. Ensembles are taking a different approach than single classifier to highlight the data. In this, more than one ensemble is constructed and combined all individual learners based on some voting strategy. In the current study, we have outlined the concept of Random forest ensembles in classification.

Key words: Machine Learning, Classification, Detection Tree, Ensembles of Decision Tree

Speedroid: A Novel Automation Testing Tool for Mobile Apps

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Abstract: Automation tools are currently underworked in Quality Assurance and Testing. Nowadays, organizations demand an intellectual tool which can support Agile, DevOps, IoT and mobile software engineering practices. These digital transformations demand smart automation tools to test various applications. Mobile

application automation tools present in the market are incapable to meet increased time-to-market pressure due to emerging ways of software development. Digital transformation and third-party relationships have escalated the complexity of testing domain. An innovative tool has been proposed in this paper that provides a smart solution for testing mobile applications. An attempt has been made to develop a mobile application automation tool named as Speedroid. Speedroid aims to provide an intelligent, integrated and automated approach to test continuously changing mobile applications. This automation tool will provide the solution for various challenges in the testing domain like complexity, efficiency, compatibility, and portability of tool that are addressed by various organizations. Our study shows that Speedriod will result as a pillar of digital transformation by providing various features like integrity, usability, efficiency, compatible to both iOS and Android, ready to use in regression testing, reporting, logging and minimal tool learning efforts without any knowledge of programming language and contributing scripts.

Keywords: Appium; Mobile automation testing; Mobile Automation Tool; Page object model; test automation.

A Shallow Parsing Model for Hindi using Conditional Random Field

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Abstract: In Natural Language Parsing, in order to perform sequential labeling and segmenting tasks, a probabilistic framework named Conditional Random Field (CRF) have an advantage over Hidden Markov Models (HMM) and Maximum Entropy Markov Models (MEMM). This research work is an attempt to develop an efficient model for shallow parsing which is based on CRF. For training the model, around 1,000 handcrafted chunked sentences of Hindi language were used. The developed model is tested on 864 sentences and evaluation is done by comparing the results with gold data. The accuracy is measured by precision, recall and f-measure and is found to be 98.04, 98.04 and 98.04 respectively.

Keywords: Conditional Random Fields, CRF, Parsing, Shallow Parsing, Hindi, Chunking.

Improving Accuracy of IDS Using Genetic Algorithm and Multilayer Perceptron Network

Thet Thet Htwe and Dr. Nang Saing Moon Kham

Abstract: Adoption of the use of internet and increase in reliance on technology, the security of computer network and information system become more and more important for all types of organizations. Since the security is all-important for any

types of organizations, we make an empirical study on network intrusion detection system which is one of the essential layers of organization security. In this study, genetic algorithm and multilayer perceptron network are used as methodologies. We divide a dataset into three parts according to the protocol and then applied the genetic algorithm for attribute selection. Multilayer perceptron network is used to train for each classifier. We examine performance differences between some recent research work and our system. The result shows that our protocol-based Genetic Algorithm and Multilayer Perceptron Network(GA-MLP) model has slightly increased in detection rate.

Key words: Intrusion Detection System, NSL-KDD Dataset, Genetic Algorithm, Multilayer Perceptron Network.

Analysis of Ensemble Learners for Change Prediction in an Open Source Software

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Abstract. As a software system evolves, the changes are introduced at every stage of its development. The timely identification of change prone classes is very important to reduce the costs associated with the maintenance phase. Thus, we develop various models which can be used in the design phase (one of the early phases) to identify the parts of software which are more change prone than others. Software metrics along with the change data can be used for developing the models. In this study, we investigate the performance of various ensemble learners and a statistical model for identifying the classes which are change prone. The use of ensemble learners give the researchers an opportunity to analyze and investigate them in the area of change prediction. The empirical validation is carried on 5 official releases of Android operating system. The overall results of the study indicate that the ensemble learners are capable of effective prediction.

Keywords: ensemble learners; software quality; change prediction; validation, metrics component.

A Robust Framework for Effective Human Activity Analysis

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Abstract. Human activity analysis is an interesting and challenging problem among the researchers of computer vision area. The applications of human activity analysis are monitoring and surveillance. There are various surveillance approaches available

in literature for witnessing activities, events or persons. In this paper, we present a robust framework for human action analysis. In the proposed framework we extract the features named generate motion image from frames deviation. Random forest is used as a feature classifier. To show the robustness of proposed framework we analyze and classify the publicly available Human Motion Database (HMDB) dataset. The average accuracy of classification is 46.83% achieved.

Keywords: computer vision, human activity recognition, random forest, surveillance camera.

A Brief Survey on Mass Based Dissimilarity Measures

Suman Garg and S.K. Jain

Abstract: Mass based dissimilarity measures, an alternative to distance based measures are effective in several data mining tasks. Performance of distance based dissimilarity measures changes significantly as the data distribution changes. This is due to dependence of distance based measures only on geometric positions of given instances. But mass based dissimilarity measures calculate dissimilarity by considering the data distribution which makes them effective in high dimensional data sets where generally used distance based measures like lp norm are not so effective. This paper discusses some widely used distance based measures and some existing data dependent dissimilarity measures. It discusses different mass based dissimilarity measures in detail and compare them based upon some characteristics.

Key words: Data dependent dissimilarity measure, mass based, nearest neighbor.

Regression Analysis for Liver Disease Using R: A Case Study

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Abstract. Decision Trees are significant approach for decision making in data mining. They are easy and efficient classification method. The use of decision tree as a classification method as an important paradigm is its capability to classify the vital attributes of a given problem. The liver disorder is difficult to detect in the early stages. With important symptoms and parameters liver disease can be found. The aim of the paper is to study the analysis of liver disorder utilizing regression tree technique using R programming language.

Keywords: Decision Tree, Classification, Medical Data Mining, R Studio.

Usability feature optimization using MWOA

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Abstract: In this paper, an optimized metaheuristic algorithm has been introduced for software usability feature selection and evaluation. Usability is becoming one of the most significant aspects of quality of software. The term 'usability' can be defined in reference to the hierarchical software usability model, where various usability factors and their features are combined in a hierarchical manner. In this work, a novel modified version of whale optimization algorithm for software usability evaluation called MWOA (Modified Whale Optimization Algorithm) has been discussed. The proposed algorithm generates an optimal solution for the search of useful usability features out of a given set of usability features. MWOA is an extension of whale optimization Algorithm (WOA), which is based on the whale behavior and to the best of our knowledge, this algorithm, is introduced for the first time in software engineering practices. The experimental results reveal that the proposed nature-inspired optimizer algorithm is able to obtain an optimal feature subset, which increases the accuracy and reduces the number of selected features.

Keywords: whale optimization algorithm, MWOA, usability model, feature selection.

PART-D: DATA MINING

Session Chair(s):

Dr. Brojo Kishore Mishra, Dr. Sanjay Malik

Sentence Similarity using Syntactic and Semantic features for Multi Document Summarization.

M.Anjaneyulu, S.S.V.N.Sarma, P.Vijayapal Reddy, K.Prem Chander, S. Nagaprasad

Abstract: Multi Document Summarization (MDS) is a process obtaining precise and concise information from a specific set of documents which are on the same topic. The generated summary makes the user to understand the content in a set of documents. The existing approaches suffer with lack of establishment of semantic and syntactic relationship among the words within a sentence. In this paper, a novel unsupervised framework is proposed to generate generic extractive multi-document summaries by ranking sentences using semantic and syntactic information embedded in the sentences. Empirical evaluations are carried using lexical, syntactic and semantic features on DUC2002 dataset. The experimental results on DUC2002 demonstrate that our summarization system implementing this framework can significantly improve the performance and make it comparable to the state-of-the-art summarization systems.

Prediction of Air Quality Using Time Series Data Mining

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Abstract: The recent bout of increased air pollution in Delhi has just made the task of identifying and controlling the causes of air pollution an extremely crucial task. In this paper, an Apriori based association rule mining algorithm, which is a modified version of the Continuous Target Sequential Pattern Discovery (CTSPD), is used to generate a set of association rules that help in predicting the concentration of air pollutants. This algorithm considers the temporal aspect of the data and hence gives the rules with continuous events only as the result. The performance of the algorithm is evaluated by mining the air quality and meteorological data from Anand Vihar, New Delhi over the period - September 1, 2015 to August 31, 2016. The prediction of the proposed algorithm is compared with that of an existing prediction system, SAFAR and found that the proposed algorithm is more accurate than SAFAR.

Keywords: Continuous Target Sequential Pattern Discovery, Time Series Data Mining, Air Pollution Prediction

Optimisation of C5.0 using Association Rules and Prediction of Employee Attrition

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Abstract. IBM Watson Human Resource Employee Attrition Data set is analysed to predict the employee attrition based on 5 selected attributes which are Gender, Distance from Home, Environment Satisfaction, Work Life Balance and Education Field out of 36 variables present in the dataset. Association Rule Algorithm "Apriori" along with Decision Tree Algorithm "C5.0" is used. The processing time taken to predict an attrition using the selected attributes using C5.0 with association is 0.02ms while using traditional C5.0 is 2ms.RAM consumption for C5.0 with association is 30.89MB while for traditional C5.0 is 48MB.This is a new approach to predict the employee attrition which is better in efficiency than simply applying Decision Tree algorithms.

Keywords: Apriori · Association Technique · C5.0 · Data Mining · Decision Tree · Employee Attrition · Entropy · IBM Watson HR · Information gain.

SoundEx Algorithm Revisited for Indian Language

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Abstract. Writing a noun word with different spellings leads to inconsistency in the database while retrieving the records. This discrepancy occurs because the retrieval of records is done through exact match of the spelling of words. Thus, to improve this, phonetic algorithms were introduced to retrieve the records from the database where matching is done through phonetics of the word instead of spelling match. In this paper, we have tried to implement the SoundEx phonetic algorithm for Hindi language to retrieve the noun words from the database. Here, we have tried to include all the vowels and consonants of Hindi language which were not included in the earlier version of the similar algorithm.

Keywords: Phonetic Algorithms, SoundEx, Edit distance, Database, Noun words.

Sentiment Analysis & Feature Extraction using Rule-Based Model (RBM)

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Abstract- In the current era, Internet provides an information platform so that each and every individual get benefited with available information and use better decision making by perceiving others attitude, opinions, sentiments and emotions. As we know Sentiment Analysis is a one of the field of natural language processing (NLP) that evaluates opinion of users and their sentiments. Based on these sentiments and opinion, an individual or group can review their product and services. In this paper we compared our Rule-Based model (RBM) sentiment lexicon features Precision, Recall and F1 Score to other known and established sentiment lexicons on Cornell movie review dataset and found the result is better and more accurate.

Keywords— Sentiment analysis, Opinion mining, NLP, Rule-Based Model (RBM), Positive (Pos) and Negative (Neg) reviews, support vector machine (SVM).

Topic oriented Multi Document Summarization using LSA, Syntactic and Semantic features

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Abstract: Multi Document Summarization (MDS) is a process obtaining precise and concise information from a set of documents described on the same topic. The generated summary makes the user to understand the important information that is present in the documents. In general, a collection of related documents which have information about a main subject. The subject has different topics which are unknown to user. Further, each document discusses one or more topics of the target subject. User wishes to have summary highlighting important information contained in the collection. The existing approaches suffer with identification of the topics with in a document and also lack of establishment of semantic and syntactic relationship among the words within a sentence. In this paper, a novel unsupervised model is proposed to

generate extractive multi-document summaries by identifying the topics that are present in the documents using Latent Semantic Analysis (LSA) and eliminating the redundant sentences that are describing the same topic that are present in the multiple documents using semantic and syntactic information embedded in the sentences. Empirical evaluations are carried using LSA, lexical, syntactic and semantic features on DUC2006 dataset. The experimental results on DUC2006 demonstrate that our summarization system significantly improve the performance and make it comparable to the state-of-the-art summarization systems.

Keywords: Multi-Document Summarization, Topic identification, Latent Semantic Analysis, Semantic Features, Syntactic Features.

A novel approach to find the saturation point of n-gram Encoding Method for Protein Sequence Classification involving Data Mining

Suprativ Saha and Tanmay Bhattacharya

Abstract: In the field of biological data mining, protein sequence classification is one of the most popular research area. To classify the protein sequence, features must be extracted from the input data. The various researchers used n-gram encoding method to extract feature value. To reduce the computational time, generally the value of n of n-gram encoding method is considered as 2, but accuracy level of classification degrades. So, it is an important research, to find the optimum value of n for n-gram encoding method, where computational time and accuracy level of classification both are acceptable. In this work, an experimental attempt has been made to fixed up the limit of scaling of n-gram encoding method from 2-gram to 5-gram. Standard deviation method has been used for this purpose.

Key words: Data Mining, Neural Network Model, Rough set, String Kernel, Proteinhashing, Support vector mechine, n-gram encoding method.

Analysis and Implementation of the Bray Curtis Distance based Similarity Measure for Retrieving Information from the Medical Repository Bray Curtis Distance similarity based Information Retrieval model

Narina Thakur and Deepti Mehrotra and Abhay Bansal and Manju Bala

Abstract: Information retrieval involves similarity estimation of the documents in a repository. It is the measure of the closeness of documents which can be in general measured as a similarity/ distance score for the user entered query. This score is used to rank and retrieve the documents from the repository based on user need. Distance-based similarity algorithms are generally of the order O (n) rather than O(n 2). A similarity measure finds its usage not only in estimating similarity score for document

retrieval but also clustering and classification. Numerous similarity measures have been suggested by researchers in the past. This paper presents a new and efficient Information retrieval algorithm using Bray Curtis Distance based information retrieval from OHSUMED. Detailed analysis show that the Bray Curtis Distance based similarity measure used for Information retrieval outperforms the other prevailing similarity methods.

Key words: Similarity; Bray Curtis Distance; Precision; Recall; Information Retrieval; Jaccard index, Cosine; Manhattan distance.

Information Retrieval on Green Mining Dataset using Divergence from Randomness Models

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Abstract. Green computing is one of the emerging aspect of technology that focuses on developing computer software and hardware devices which helps to reduce the power usage and carbon consumption. Today, with proliferation of smartphones, tablets and other unwired gadgets, energy efficiency is becoming a key consideration while designing software and hardware components where the energy consumption is closely related to battery lifetime. Manufacturers and
Developers look forward to energy-efficient solutions across the stack, with more established results through research and innovations in application design, hardware/ architecture, operating systems, and runtime systems. The objective of the research is to evaluate the recall and the precision of the dataset using the various Divergence from Randomness (DFR) models. The corpus used in the research was a Green Computing dataset that consisted of about 300 questions along with their answers. The topic files and Query Relevance judgement (QREL) files were created for all the questions and the answers. The results indicate that OKAPI probabilistic model has the highest precision.

Keywords: Green Computing, Divergence from Randomness, Information Retrieval, Energy, Power, Consumption, QREL, Green Mining, usage, topic

Statistical Survey Of Data Mining Techniques: A Walk Through Approach Using MongoDB

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Abstract- Big Data is a term used for management of large, unstructured and complex data. It is used to organize data such that it is easy to read and understand. In today's world of digitization, it becomes important to track the growth and evolution of data mining techniques. This paper makes an effort in this direction as thorough and in depth study has been carried out of several mining techniques. Also to show effectiveness of data mining techniques, simulation has been carried out of the real time dataset in MongoDB.

Keywords: Machine Learning; NoSQL; MongoDB; Data Mining; Crowdsourcing; Internet of things.

Analysis of Refactoring Effect on Software Quality of Object Oriented Systems

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Abstract. Software industry primarily recognizes the significance of high quality, robust, reliable and maintainable software. The industry always demands for efficient solutions that can improve the quality of software. Refactoring is one such potential solution; however literature shows varied results of application of refactoring techniques on software quality attributes. There are number of refactoring techniques that still need to be empirically validated. This paper focuses on analyzing the effect of four unexplored refactoring techniques on different software quality attributes like coupling, cohesion, complexity, inheritance, reusability and testability on object oriented softwares. Impact analysis is performed by calculating Chidamber-Kemerer (CK) metrics of the projects, both before and after applying the refactoring techniques and results are statistically validated. Empirical analysis of results revealed that different refactoring techniques have different effect on internal and external quality attributes of object oriented systems.

Keywords: Refactoring, Object Oriented metrics, Software Quality.

Prevailing Approaches and PCURE For Data Retrieval From Large Databases

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Abstract. Tremendous and exceedingly vast data is collected nowadays by every organization which is getting continually increased. It became very difficult to retrieve relevant information from these endlessly rising large group of data. Data

mining has emerged to retrieve precious information that gets buried in large databases. Among various functionalities of Data mining, clustering became very effective in determining related data. This work is focused on CURE(Clustering Using REpresentatives) which is one of the most widely used hierarchical clustering technique of data mining. It started its work by reducing the size of the original database. For that, it made the use of simple random sampling (SRS) technique, followed by partitioning of the reduced database. It also made use of other important techniques but still resulted in a number of shortcomings. It is required to eradicate the limitations in the traditional working of CURE clustering. So, this paper avoids the use of sampling and focuses on its enhancement by integrating it with the concept of "Map-Reduce" along with "Corewise Multithreading". This combination is useful for analyzing-searching huge voluminous data by providing the most effective ability of parallel processing, fault tolerance, and load balancing. The proposed approach is parallelization of one of the data mining clustering technique - CURE and thus named as PCURE (ParallelCURE).

Keywords: Data Mining, Clustering, CURE, Sampling, MapReduce, Big Data, parallelism, M2ing, PCURE.

Distant supervision for large scale extraction of gene-disease associations from literature using DeepDive

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Abstract. Understanding the genetic mechanism of a disease can solve a variety of problems such as personalized precision medicine, new drug development or repurposing them. Technological advancement in biology leads to methods like next-generation sequencing (NGS) which produced large sets of genes associated with diseases in the form of variants and biomarkers. All these findings are reported as a huge collection of scientific literature, which is rapidly growing every day. In this study, we present a distant supervision methodology for finding the gene-disease associations from literature in large scale. We used DeepDive system, which is highly successful in relation extraction from a wide variety of sources such as image and text. In this study, we build a gene-disease relation extractor by feeding a highly sophisticated feature set to DeepDive and extracted associations from 879585 PubMed articles. Our system identified candidate gene-disease associations from abstracts and calculated a probability for each association. Overall, our system produced a set of 75595 associations using a domain-specific distinct feature set from over 879585 abstracts.

Keywords: Text Mining, BioNLP, Gene-Disease Relation Extraction, Distant Supervision, DeepDive.

Comparative Analysis of Privacy Preserving Data Mining Techniques

Neetika Bhandari and Payal Pahwa

Abstract: Data Mining is the technique used to retrieve useful information, relationships and patterns from huge databases and data warehouses. It is an important phase of the Knowledge Discovery of Databases process which can be applied on Big Data. Mining on Big Data has various limitations which include protecting sensitive data and securing the useful information extracted from unauthorized access. Privacy Preserving Data Mining (PPDM) aims to protect the sensitive data and information during the mining process. PPDM techniques have gained the attention of the researchers in recent times. In this paper, we have listed them and identified their advantages and limitations along with the algorithms following these techniques.

Keywords: Data Mining, Knowledge Discovery in Databases (KDD), Privacy Preserving Data Mining (PPDM), Big Data.

Opinion Mining of Saubhagya Yojna for Digital India

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Abstract. A government policy is an ideology of principles, ethics, regulations and set of rules introduced or constituted by government in interest of normal citizens across country. The purpose of making a policy or scheme is to explore and strengthen the favourable outcomes or profits and to minimize the adverse effects noticed by government. On the flip side, all the government policies are destined to be efficacious but on the contrary may affect the routine life of a common man. An efficient and endless process of policy evaluation may leads to accurate assessment of progress graph or outcomes of policy in order to improve the social and economic conditions of different stakeholders. The aim of this paper is to evaluate one of the recent government policy, Pradhan Mantri Sahaj Bijli Har Ghar Yojana, or Saubhagya initiated by Indian government to accomplish global electrification across country. In this paper, an attempt has been made to analyze the public perception of this scheme by using opinion mining techniques to understand the positive and negative impact of this policy over indian citizen. Twitter as a social media tool has been used for collecting and extracting public opinion or sentiments over this scheme.

Keywords: Opinion Mining; Government Policy; Saubhagya; Twitter

Improving Recognition of Speech System using Multimodal Approach

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Abstract. Building an ASR system in adverse conditions is a challenging task. The performance of the ASR system is high in clean environments. However, the variabilities such as speaker effect, transmission effect and the environmental conditions degrade the recognition performance of the system. One way to enhance the robustness of ASR system is to use multiple sources of information about speech. In this work, two sources of additional information on speech is used to build a multimodal ASR system. A throat microphone speech and visual lip reading which are less susceptible to noise act as alternate sources of information. Mel frequency cepstral features are extracted from throat signal and modeled by HMM. Pixel-based transformation methods (DCT and DWT) are used to extract the features from the viseme of the video data and modeled by HMM. Throat and visual features are combined at the feature level. The proposed system has improved recognition accuracy compared to unimodals. The digit database for English language is use for the study. Experiments are carried out for both unimodal systems and the combined systems. The combined feature of normal and throat microphone gives 86.5% recognition accuracy. Visual speech features with the normal microphone combination produces 84% accuracy. The proposed work (combines normal, throat, and visual features) shows 94% recognition accuracy which is better compared to unimodal and bimodoal ASR systems.

Keywords: Automatic speech recognition, Hidden Markov Model, Multimodal system, Visual Lip Reading, Discrete Cosine Transform, Discrete Wavelet Transform

Web page Segmentation towards Information Extraction for Web Semantics

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Abstract: Today, web is a large source of information which may be structured or unstructured. The need is efficient information extraction from various unstructured sources on the web. Therefore information extraction is playing a prominent role in current scenario. It focuses on automatically extracting structured information from unstructured distributed resources on the web and is based on several approaches. Web page segmentation is one of the most significant techniques where a web page is break down into semantically related parts. There are various approaches to Web page segmentation. In this paper, first information extraction has been explored, discussed and reviewed. Second, a revisit has been done on web page segmentation and its

various approaches where a comparative analysis has been made. Third, various phases of vision based web page segmentation have been presented and reviewed along with a flowchart. Finally results and conclusions have been presented along with future work.

Keywords: Webpage segmentation, Information Extraction, vision based web page segmentation.

Towards an Evolved Information Food Chain of World Wide Web and Taxonomy of Semantic Web Mining

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Abstract. The addition of semantic knowledge has completely revamped the World Wide Web (WWW).The taxonomy of Web Mining traditionally classifies it broadly into the three sub-types of Web Content Mining, Web Structure Mining and Web Usage Mining. But with the emerging concepts of semantic web, the boundaries of this classification got more and more blurred. Hence, there is a need to classify Web mining taking into consideration the changing semantics of the web. This paper presents the evolved taxonomy of Semantic Web Mining which has noticeably developed over the years. Along with this, it also presents the Expanded Information Food chain of the WWW in the new-era web which has been unfolding over the last two decades. Further, an approach for differentiating between the segments of "Utilizers" and "Contributors" to the Semantic-Web data is also put forward. This increased awareness would facilitate in increasing "Contributors" for completing the loop of transforming the Current Web to the Intelligent Web; as envisioned by the founder of World Wide Web.

Keywords: Semantic Web Mining, Taxonomy, Information Food Chain, World Wide Web, WWW, Intelligent Web.

PART-E: SOFT COMPUTING, BIG DATA & CLOUD COMPUTING

Session Chair(s):
Dr. Arun Sharma, Dr. Rashmi Agarwal, and
Dr. Neha Gupta

Subject Independent Emotion Detection from EEG signals using Deep Neural Network

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Abstract- There is a large variation in EEG signals from human to human. Therefore it is a tough task to create a subject independent emotion recognition system using EEG. EEG is reliable than facial expression or speech signal to recognize emotions, since this cannot be self-produced. The proposed study aims to develop a subject independent emotion recognition system with a benchmark database DEAP. In this work, Deep neural network with simple architecture is used to classify low-high valence and similarly low-high Arousal. EEG signals are non-stationary signals. In this, stochastic properties as well as spectrum changes over time. For these types of signals Wavelet transform would be suitable as features hence Wavelet transform is used to obtain different frequency bands of EEG signals.

Keywords: Electroencephalogram, Affective computing, Deep-neural network.

The Role of Big Data Predictive Analytics Acceptance and Radio Frequency Identification Acceptance in Supply Chain Performance

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Abstract. In recent years, organizations are extracting knowledge from the huge volume of data to predict future trends. Specific applications have been developed for big data predictive analytics to utilize the current data in different industries. The efficiency of big data can be enhanced with the use of radio frequency identification (RFID) technique in supply chain management (SCM). The objective of this study is to established, and empirically investigates the relationship among big data predictive analytics (BDPA) acceptance, RFID acceptance and supply chain performance (SCP). The population of this study is logistics industry in China. Results showed the positive direct effect between BDPA acceptance and SCP, and RFID acceptance has partially mediate. The implementation of this study will enhance supply chain performance in the logistics industry. This study also fills the literature gap because previous studies have not established the relationship between big data analytics acceptance with RFID acceptance in SCM.

Keywords: Supply Chain Management (SCM), Big Data Predictive Analytics (BDPA) Acceptance, Big Data, Logistics, Radio Frequency Identification (RFID) Acceptance, Supply Chain Performance (SCP).

Peering Through the Fog: An Inter-Fog Communication Approach for Computing Environment

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Abstract: The advent of cloud computing has brought forth a wave of IoT devices and the number of devices connected to the cloud has been growing expeditiously. With this increase in demand, there is an imminent need for a more efficient solution for managing the IoT devices– Fog Computing. Fog computing brings the concept of cloud computing closer to the edge of the network. These fog devices may be interconnected across, in addition to a hierarchical connection. In this paper, we discuss the advantage of installing this auxiliary connection i.e. linking of adjacent fog nodes at the same level. We have proposed an architecture that would provide a low latency alternative to traditional fog network connection. An algorithm is defined to support the proposed architecture which is further stimulated by the case of a parking scenario. The experiment is conducted and the results have proved that our proposed architecture shows lower latency as compared to the traditional fog architecture.

Keywords: Cloud Computing, Fog computing, Inter-fog communication, IoT

A Comparative Evaluation of QoS based Network Selection between TOPSIS and VIKOR

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Abstract. Significant research to establish a seamless connection through a vertical handover process has been carried out in the past. Selecting a suitable access network to support roaming, give rise to wide challenges. A mobile terminal decides when to transfer the call connection through a handover process and the entire control process is carried out by the mobile devices. A mobile terminal based decision often creates high latency and thereby gives way for high call drop as the terminal or the mobile user is unaware of the network conditions. The aim of this paper is to design and implement network controlled selection for handover process. TOPSIS and VIKOR is compared to selection score to utilize MADM scheme to perform handover in a wireless network to avoid unnecessary handover.

Keywords: Network selection, TOPSIS, VIKOR, wireless network, handover process

Handling Big Data using Map-Reduce over Hybrid Cloud

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Abstract. Today is the world of digitalization and we cannot imagine digital world without Big Data over cloud infrastructures. The best financially savvy strategy to manage the expanding intricacy of huge information investigation is half and half cloud divide that leases brief off-start cloud assets to support the general limit amid top use of information. Half breed cloud framework make a domain for accessible for all intents and purposes boundless measure of computerized and informatics assets, which are overseen by outsiders and are gotten to by clients in secure way and as indicated by pay-examine way, with best Quality of Services. It empowers advanced figuring frameworks to be scaled all over as needs be to the measure of information to be handled. MapReduce is among the most famous models for advancement of Cloud applications. MapReduce is a famous procedure of Hadoop Big Data for dissecting expansive datasets and groups. It takes into account parallel handling of a lot of information over half breed distributed computing assets. Hadoop strategy of Big Data is an open-source usage of MapReduce and utilizations the Fair scheduler to relegate delineate lessen capacity to the different registering hubs. This paper we can fetch data using map and reduce function of Hadoop pig framework over hybrid cloud resources.

Keywords: Cloud Computing, Hybrid Cloud, Big Data, Hadoop, Map-Reduce, Pig.

Text Summarization for Big Data: A comprehensive survey

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Abstract: Availability of large volume of online data has necessitate the need for automatic text summarization. In this paper a survey of various text summarization accomplishments that have been implemented in recent past is discussed. An intentional weightage is given to the issue of legal text summarization, as summarization as a tool has a great scope in legal domain. Paper starts with a brief introduction of automatic text summarization then succinctly mention the novel advances in extractive and abstractive text summarization techniques and then move to literature survey, it finally winds up with some future work directions.

Fuzzy Risk Assessment Information System For Coronary Heart Disease

Dr. Pankaj Srivastava and Dr. Neeraja Sharma

Abstract: It is well-known fact that Coronary Heart Disease (CHD) is spreading worldwide due to the lavish lifestyle of people and this one is verified by the report of WHO which declared South Asian Subcontinent a hub of cardiac disease people. Several known and vague factors play the major role which is responsible for CHD. In the present, paper we made an attempt to develop Fuzzy Informative System for risk assessment scheme for CHD by making use of fuzzy relational features and assessment function to assess the different phases of the cardiac patient.

Key words: Soft computing, Fuzzy Tools, Coronary Heart Disease(CHD), Risk Assessment Function, Blood Pressure(BP), Cholesterol, Triglyceride.

A soft-computing based approach to Group relationship analysis using weighted arithmetic and geometric mean

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Abstract: Relationships patterns between social entities in the social network are the main attribute that plays important role in our lives. They are mostly complexes in nature and uncertain to find out. To quantify these relationships patterns is a very potent issue in social networks analysis. This paper proposes a robust function that finds the relationships between groups of finite size based on fuzzy graphs theory. The relationship among elements in-group is found out by using the arithmetic mean or geometric mean. This paper has taken advantages of both weighted arithmetic and geometric mean, which combines the advantage of both arithmetic, and geometric mean. The weights taken are the function of the importance of both the social elements participating in a term. These weights can be the parameters like the betweenness centrality or closeness centrality**.**

Keywords: Social networks, social network analysis, fuzzy graphs, arithmetic mean, geometric mean, betweenness centrality, closeness centrality.

Implementation of MapReduce using Pig for Election Analysis

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Abstract: The main goal of this project focuses on providing another way to conduct elections by highlighting the fundamental flaws present in the current system. The

present election system considers the number of votes gained by a candidate as the only parameter to select the winner. Our system will be selecting the deserved candidate by considering, parameters such as the educational qualifications, criminal records, previous term record, past social work, personality, popularity, etc. Our proposal also aims at highlighting the distinction between the most deserving candidate to win the election and the candidate who is anticipated to win based on his or her popularity. The final output will clearly reflect the loopholes present in the current system. We want the current election process to not be a contest of popularity only. We aim to bring about an evolutionary change in the current election process to make it better and unprejudiced**.**

Keywords: Hadoop, Election System, Sqoop, Flume, Hive, Cloudera, Pig, Qlik Sense, MySQL.

Big Data in Health Care

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Abstract. The evolution of technology and digital devices has qualified a whole new dimension of big data analytics that can lead to massive developments across the world in every sector including healthcare. This paper illustrates the challenges and applications of Big Data in healthcare. Big Data in Healthcare is a vast area of study that includes numerous data records, simultaneously; increasing storage of the technology has aided us to store this data. The study is based on different sources of secondary data, thus, is descriptive and qualitative in nature. The details of Big Data analytics in Healthcare were acknowledged by a methodical literature review, after which selected examples for future benefits were also evaluated. In the end, based on the assessment, possible ways to minimize the challenges and issues, future prospects and possible suggestions were given. To conclude, the paper covers the challenges, issues, applications, and future scopes of Big Data in Healthcare.

Keywords: Bigdata, Healthcare, challenges, applications and analytics

Domain Specific Fuzzy Rule-Based Opinion Mining

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Abstract: Opinion mining's goal is to recognize the behavior or emotion of people. To encash human thoughts, views in spreading awareness through social media for positive changes in public interest like health, natural disaster, education and many more. This paper is an attempt for driving social awareness among people relevant to drought. The proposed model considers opinion on drought related issues and predict the sentiment behind each view. The major issue while processing the opinion, view of candidate is about natural fuzziness in-build in words expressed. This fuzziness in

words actually helps to understand the depth of the word. So to encash the depth of the word fuzzy rule based approach is proposed which reduces the computational complexity and increases the interpretability. The patterns allows the system to provide more precise result which is our work has been categorized in 6 major categories that is negative, moderately negative, highly negative, positive, moderately positive and highly positive. After applying this pattern we got more precise results for sentiment analysis.

Keywords: Data Mining, Sentiment Analysis, Social Media, Domain Specific, Drought, Association Rule Mining, Fuzzy Rule.

A Novel Framework for Automated Energy Meter Reading and Theft Detection

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Abstract. Energy crisis is one of the most important issues that the entire world is facing today. The feasible solution for the energy crisis problem needs optimal utilization of available energy. However, the state-of-the art energy metering systems suffer due to issues such as low battery backup, poor network connectivity and excessive memory consumption. To overcome these drawbacks, a novel automated energy metering framework is proposed in this paper, which makes use of Microcontroller based implementation for its operation. Specifically, Consumer can get the energy consumption statistics instantly on a LCD screen. Further, whenever any consumer attempts to tamper the energy meter, magnetic sensors get actuated and sends appropriate signals to the microcontroller, which in turn sends theft event messages to the management side for further processing. Experimental setup and results indicate the good performance of the proposed framework in terms of energy consumption display on LCD screen, which significantly help the customer to monitor their energy consumptions.

Keywords:. Programmable Interface Controller (PIC) microcontroller, Global System for Mobile communication (GSM) modem, electricity theft, automated meter reading, energy crisis, opto-interrupter, Internet of Things (IoT).

A Model of Fuzzy Intelligent Tutoring System

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Abstract: Learning is a process which is actively constructed by the learner itself. With the advent of technology in the field of Artificial Intelligence, learning is no more restricted to traditional classroom teaching. Cognitive Systems can be used to

impart pedagogical education to learners. Cognitive systems are those intelligent systems which can think, decide, act and analyze learner‟s learning accordingly and can help them in generating significant learning. Intelligent Tutoring System (ITS) provides its learners with a one-to-one tutoring environment where intelligent agents can act as tutors. In this paper, a model of Fuzzy-ITS is proposed and evaluated using fuzzy rule set which has capabilities to enhance the skills of learners by providing instructions and feedback.

Keywords: Intelligent Tutoring Systems; Fuzzy ITS; Intelligent Agents; Cognitive Systems; Fuzzy Inference System; ITS.

A Trust Rating Model using Fuzzy Logic in Cloud

Vidhika Vasani and Vipul Chudasama

Abstract: Cloud computing provides services from the available pool of resources. Even with the available condition cloud computing reach peak of success among cloud user. The issue they face is the barrier of trust between the end-users for using the given services. Conventional security and protection controls keep on being executed on cloud however because of its liquid and dynamic nature, a testable trust estimate of the cloud is required. This research paper exhibits an analysis of the present trust administration strategies for cloud operations. In this research paper, here we proposed a model for Trust administration using Fuzzy Logic, which can help cloud service providers to select trusted datacenter for consumers.

Neural Networks for mobile data usage prediction in Singapore

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Abstract. Pricing strategy is driven by prediction. Forecasting using neural networks have indicated the rise in use of artificial intelligence. The manuscript presents the prediction of mobile data usage using with the use of Artificial Neural Networks. A dataset from Singapore was used for generating results for reporting the potential use of artificial intelligence in forecasting. Recently pricing war in the mobile service industries has been contagious and has affected the decision making of leading enterprises. The manuscript aims to report use of neural networks for prediction and insight development. Results generated using MATLAB, neural network toolbox have been discussed with inferences in the manuscript.

Keywords: Neural Network, Artificial Intelligence, mobile data, drill rate

Candidates Selection Using Artificial Neural Network Technique in a Pharmaceutical Industry

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Abstract. Artificial neural network (ANN) is a useful technique in decision making which can replicate the biological thinking pattern of the human decision maker. By providing the learning way of a supervised and unsupervised process we can train the ANN to give the output as accurate to the human judgment. This technique has been used in solving multiple problems including forecasting and to predict the solution. In this work, ANN has been used for the candidates' selection in the pharmaceutical company. To replicate the human judgment or expert opinion in the selection process of human resource management by the supervised learning setting. So that we can eliminate the human judgment with ANN.

Keywords: Artificial Neural Networks (ANN), decision making (DM), prediction, forecast.

Halftoning Algorithm Using Pull Based Error Diffusion Technique

Arvind Bakshi and Anoop Kumar Patel

Abstract: Despite of several improvements in the field of digital halftoning, there is still a scope of improvement. Halftoning is widely applied for applications like printing, efficient transmission and storage etc. Halftoning process reduces 256 levels of a greyscale image to just 2 levels. Three major categories of halftoning are: 1) Dithering, 2) Error Diffusion, 3) Iterative algorithm. A concern always remains regarding visual perception of an image's halftone output and for obtaining a good visual perception we have proposed an error diffusion algorithm that applies pulling technique. The perception in output image generated by our algorithm is similar to the input. The SSIM (structure similarity index map), PSNR (peak signal-to-noise ratio), RMSE (root mean squared error), MSE (mean squared error), of output image are 0.1426, 7.2672, 110.4531, and 1.2200e+04 respectively.

Key words: Error Diffusion, Filter, Forward processing, Greyscale, Halftoning, Pull method.

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