Chair Message

As a chair I have the honor to welcome you with great respect and enthusiasm to the third International Conference on Recent Trends in Computer Science and Electronics Engineering (RTCSE’18) to be held at Radisson Blu Plaza, Bangkok, Thailand on 02 – 03 January 2018. It is the 6th conference hosted by Gyancity Research Lab and as a founder member I hope that we will continue to provide such forums in future as well. RTCSE’18 intended to attract innovative technical and scientific work in the field of computer science and electronics engineering. The response to the conference was overwhelming and I am proud to state that we have received really good quality contributions and I am sure as a participant you will share the same sentiment later.

I am pleased to inform you that we received more than 400 papers. In order to maintain publication ethics and practices of various Journals, we accepted only 96 papers (24% acceptance rate). All accepted papers will be submitted to Scopus/Thosmon Reuters/Springer/Crossref Index Journals (see list on conference website) and hopefully these papers will be available online by middle of 2018.

As a chair and on behalf of the organizing committee I sincerely hope that RTCSE’18 will offer a great venue at Bangkok to the participants coming from different parts of the world to share and contribute in the areas of their expertise. We hope to provide a good platform to the participants of RTCSE’18 where not only they meet and share their vision, ideas but also fertilize their thoughts in the ever-growing area of computer science and electronics engineering technologies.

I am also confident that our keynote speakers will be able to enrich your knowledge during the conference and I wish you a very pleasant and enjoyable stay in Bangkok, Thailand.

Best wishes.

Dr. D. M. Akbar Hussain, Member IEEE, IAENG
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## RTCSE’18 Schedule

### 2nd January 2018

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| **Video Presentation** | Available 24x7 on YouTube Channel of Gyancity Research Lab: [https://www.youtube.com/channel/UCHt8lX81evhmQb3zQ8uCA](https://www.youtube.com/channel/UCHt8lX81evhmQb3zQ8uCA)  
Paper Id: 25, 27, 64, 103, 116, 118, 129, 216, 219, 237, 238, 243, 257, 285, 286, 374, 376, 383, 384, 386, 389 | **10:00-13:00** Satellite Skype Sessions @ The Oxford College of Engineering, India  
Chaired by Prof Preeta Sharan, The Oxford College of Engineering, India |
| **09:00-13:00** | Skype Sessions @ Bangkok, Thailand  
Paper Id: 1, 2, 9, 69, 70, 122, 245  
Chaired by Prof Akbar Hussain, Aalborg University, Denmark |  
| **15:00-17:00** | Reporting at Registration Desk | **3rd January 2018**

### 3rd January 2018

<table>
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<th>Time</th>
<th>Activity</th>
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| **08:00-09:00 AM** | Reporting at Registration Desk | **09:00-09:45 AM** Inaugural Speech: Chair Prof Akbar Hussain, Aalborg University, Denmark  
Inaugural Keynote: Albizia Mapping, Disaster Planning and Risk Management in Hawaii *Jason Levy Ross Prizzia. University of Hawaii, USA |  
| **09:45-11:15 AM** | **Session 1 and Session 2 Presentations**  
Session 1:  
Chair: Ross Prizzia, University of Hawaii  
Location: A Building  
Presentations: 35, 36, 50, 54, 55, 63, 65, 259, |  
| | Session 2:  
Chair: Prof Gaurav Verma, JIIT, India  
Location: B Building  
Presentations: 12, 33, 34, 47, 66, 91, 131 |  
<p>| <strong>11:15-11:30 AM</strong> | Coffee Break |</p>
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<td>11:30-13:30 AM</td>
<td><strong>Session 3 and Session 4 Presentations</strong></td>
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<td><strong>Session 3:</strong></td>
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<td>Chair: Prof. Sayed Hyder Abbas Musavi, Indus University, Pakistan and Prof Akbar Hussain, Aalborg University, Denmark</td>
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<td>Location: A Building</td>
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<td><strong>Session 4:</strong></td>
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<td>Chair: Prof Geetam S Tomar, MIR Lab, India and Prof B S Chowdhry, MUET, Pakistan</td>
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<td>Location: B Building</td>
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<td>12:30-14:00 PM</td>
<td>LUNCH</td>
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<td>14:00-14:30 PM</td>
<td>Second Keynote by Prof. Geetam S Tomar, MIR Lab, Gwalior, India</td>
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<tr>
<td>14:00-17:00 PM</td>
<td><strong>Session 5 and Session 6 Presentations</strong></td>
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<td><strong>Session 5:</strong></td>
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<td>Chair: Prof Sadiq Khan, KU, Pakistan, and Prof Surya N Panda, Chitkara University, India</td>
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<td>Location: A Building</td>
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<td><strong>Session 6:</strong></td>
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<td>Chairs: Prof Adesh Kumar, UPES, India and Prof Akbar Hussain, Aalborg University, Denmark</td>
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<td>Location: B Building</td>
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<tr>
<td>17:00-17:15 PM</td>
<td>Third Keynote by Prof Surya N Panda, Chitkara University, India</td>
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<td>17:15-17:45 PM</td>
<td>PC Chair Dr. BS Chowdhry with Conference Chair Prof G S Tomar will honor all the participants with a Presentation Certificate.</td>
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<td>17:45-18:00 PM</td>
<td>Conference Closing: Prof. Akbar Hussain.</td>
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<td>18:00 -18:30 PM</td>
<td>Coffee Break</td>
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Chair

GENERAL CHAIR

- D. M. A. Hussain, Aalborg University, Denmark
- Geetam S Tomar, MIR Lab, Gwalior, India

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- Noor Zaman, King Faisal University, Saudi Arabia □
  Osama Moh'd Alia, University of Tabuk, Saudi Arabia.
- Tanesh Kumar, University of Oulu, Oulu, Finland
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- Mukesh Negi, Technical Project Manager, TechMahindra, Noida, India.

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• Md.Mahbub-E-Noor, University of Barisal, Bangladesh.
• Minal Dhankar, Maharaja Surajmal Institute of Technology, Jankpuri, Delhi, India
• Mohsin Jami, National University of Sciences and Technology (NUST), Pakistan.
• Neha Sharma, Dept. of Electronics, Keshav Mahavidyalaya, University of Delhi
• Naresh Sharma, Delhi University, Delhi, India
• Nitish Rajoria, Keio University, Japan
• Om Jee Pandey, IIT Kanpur, India
• Pabak Indu, The University of Burdwan,Burdwan,West Bengal, India
• Pankaj Khanna, Acharya Narendra Dev College, University of Delhi
• Paresh Khaneja, Quickheals, India
• Puneet Tomar, Gyancity Research Lab, India
• Payal Arora, Gyancity Research Lab, India
• Prabhak Ranjan Singh, Wuhan University of Technology, China
• Rajendra Aaseri, Lovely Professional University, Jalandhar, India
• Rashmi Sharma, Gyancity Research Lab, India
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• Shant Bhusan, IIT Gwalior, India
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• Shivani Sharma, Gyancity Research Lab, India
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• Sushant Shekhar, Jaypee Institute of Information Technology, India
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• Vandana Thind, Gyancity Research Lab, India
• Vijay Bhaskar Semwal, IIIT Allahabad, India
• Vishok Singh, IMS Unison University, Dehradun, India

CONVENER

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<td>Application of Very High-resolution Pictometry Imagery to Assessing Albizia Risk in Hawaii</td>
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Qi Chen University of Hawaii, USA,
Jim Jacobi (USGS) and Ross Prizzia, University of Hawaii, USA

**Abstract:** Very high-resolution (ca. 20 cm pixel) georectified Pictometry imagery is available for many regions of the world, including most of the United States. This Pictometry imagery is applied to assessing the risk of Albizia (Falcataria moluccana), one of the fastest growing trees in the world. In Hawaii, Albizia has become naturalized in many wet lowland areas where it spreads rapidly due to large numbers of windblown seeds. In order to release the damage of Albizia tree, detection and mapping the spatial distribution of Albizia trees in Hawaii is crucial. Remote sensing has been used for decades to measure and map the biophysical characteristics of vegetation. The recently launched WorldView-2 satellite is able to provide eight multi-spectral bands with a 2-m spatial resolution. The conventional methods for classifying high resolution images suffer from spectral similarity between classes and large variability within classes. In this study, we proposed a novel classification methodology by using the state of the art machine learning algorithms and by combining image features from both spectral and spatial domains. We tested this method in the Manoa Watershed along a coast-to-mountain gradient that is characterized by a large variety of tree species. The results showed that the accuracy of our classification methodology is substantially higher than the conventional pixel-based maximum likelihood classifier.

This methodology will be extended to map Albizia for the whole state of Hawaii.
## Information and Computer Technology for Reducing Climate Change Disaster Risk: Advances in Carbon Sequestration

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**Abstract:** Global Climate change is an extremely complex, multi-disciplinary field: there are may be hundreds or even thousands of conflicting criteria that must be considered, including tangible factors (monetary costs, infrastructure damage, etc), intangibles (such as socio-psychological variables) and geospatial variables (Kingston et al., 2000) as well as demographic, energy, technologic and climatic trends. This requires the use of Information and Computer Technology, specifically Decision Support Systems (Sprague, 1983), in order to incorporate the diverse interests, priorities and values of all stakeholders including accountability, profitability, transparency, equity, fairness and ethics. Moral and ethical values held by the stakeholders may be as important as technical issues, placing high demands on the decision making process: Hawaiian sustainability values including Auamo Kuleana (collective transformation through individual excellence), ‘Ike ‘Āina (knowledge learned from connection to land) and Aloha ‘Āina (love and commitment to land) are used to drive sustainability decisions in Hawaii. The field of Multiple Criteria Decision Making (MCDM) is used to examine the effectiveness of carbon sequestration for disaster risk reduction and climate change planning and management. MCDM has long been applied to the planning and management of complex sustainability problems involving strategic uncertainty at the “wicked” level of decision making (Hipel, 1992). MCDM techniques are widely used to identify alternatives that are dominated by at least one other alternative (Hwang and Yoon, 1981). The rapid growth of MCDM for climate change issues is due to a number of factors, including dissatisfaction with conventional “single criterion” methods and the emergence of more powerful processors and new software and algorithms. A real-time MCDM Decision Support System (DSS) architecture is put forth that integrates advances in MCDM, ge-engineering, GIS, climate change models, spatial statistics and real-time information systems (Worboys and Duckham, 2004) for climate change issues on Oahu, Hawaii. It is shown that DSS and MCDM can improve sustainable climate change planning and management under uncertainty by providing data displays, analytical results, and model output to summarize critical information. Pareto optimal options include advances in biotechnology, investment in sustainability education and novel conservation measures are put forth and discussed. There have been several major coastal storms to affect Pacific islands in recent decades: Hurricane Iniki (in the central North Pacific) hit the island of Kauai in Hawaii in 1992, leading to $2.5 billion in physical
damages and Super Typhoon Pongsona (in the western North Pacific) caused $700 million in damages on the island of Guam in 2002. The strong winds, heavy rains, and storm surge that accompany these extreme climatic events pose a direct threat to the well-being of Pacific island communities. In particular, climate-related sea-level rise is an ongoing and accelerating process (with thermal expansion of the upper ocean posing the greatest immediate challenge) which may cause catastrophic inundation, erosion and involuntary relocation in some Pacific island nations. For example, in the island state of Tuvalu, a ring of nine Polynesian islands, several thousand people have already left for other nations as rising seas displaced communities from low-lying coastal areas.

Keywords: Information and computer technology, climate change, carbon sequestration, disaster risk
Machine Learning for Albizia Classification and Management: Advances in Pictometry and Artificial Intelligence for Estimating the Economic Impacts of Disasters:

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Abstract: Machine learning algorithms constitute sophisticated and transformative tools that hold tremendous promise for creating predictive environmental data driven models that can capitalize on large quantities of multivariable environmental data and provide valuable insights for the regional sciences, particularly when integrated with an Inter-Regional Input Output (IRIO) Analysis. The state of Hawaii is faced with a potentially overwhelming economic burden posed by the invasive and fast-growing F. moluccana (Albizia). First brought to Hawaii from Indonesia approximately a century ago, the tree constitutes a roadside, urban forest and residential pest of major significance affecting transportation, critical infrastructure, agriculture, natural resources, residences, businesses and human health. In particular, the catastrophic failure of F. moluccana's massive limbs creates life safety hazards in residential areas by blocking thoroughfares, knocking down powerlines and dropping onto cars, homes, fences and backyard areas where children play. Key objectives of this analysis are to use machine learning algorithms to classify the location of these hazardous trees and to assess the economic impacts of these hazardous trees. There exists a growing ecosystem of frameworks like PostgreSQL, Matlab, Tensor Flow and Scikit-Learn that provide a platform for machine learning. It is shown that object-based classification combined with machine learning algorithms significantly increase classification accuracy. Our original approach is applied to mapping the spatial distribution of F. moluccana on Kauai, Oahu and the island of Hawaii (i.e. "Big Island") in the Hawaiian archipelago. It is shown that the proposed method constitutes a promising approach for estimating economic damages to the economy of Hawaii. The invasive alien Albizia (Falcataaria moluccana) is a very large, fast-growing, nitrogen fixing tree in the legume family (Fabaceae). Recognized as the world’s fastest growing tree species, mature trees can reach heights over 115 feet, with the canopy of a single tree extending over a 50,000 square foot area. F. moluccana in Hawaii can grow as fast as an inch day in height (more than a foot every two weeks). Individuals reach reproductive maturity within four years and they produce abundant seed (contained within seed pods) that can be wind-dispersed over substantial distances (i.e. more than 600 feet), allowing the trees to spread rapidly over large areas. The broad umbrella-shaped canopies of multiple trees commonly coalesce to cover dozens of acres (and even up to hundreds of acres). With no natural predators to constrain them, F. moluccana populations are increasing in both stature and area, with concomitant
maintenance costs increasing annually. The taxpayers and citizens of Hawaii may be faced with a massive economic burden posed by F. moluccana which also constitutes a roadside, urban forest and residential pest of major significance. Individual trees rapidly and routinely reach heights over 100 feet and large branches have been recorded breaking and falling due to age, hidden weaknesses which are not visually observable (the wood is prone to rot and insect infestation), or weather (heavy rain and minor wind gusts). F. moluccana also is prone to “sudden limb drop”, where the weak wood will break off and fall with no apparent disturbance. In addition, natural events such hurricanes or storms often cause extreme damage to F. moluccana stands which in turn contribute to road closures, electrical outages, and property damage, thus exacerbating post-storm and hurricane cleanup and repair work. For example, after Tropical Storm Iselle, dozens of people were trapped and several homes crushed by falling F. moluccana which left 30,000 people without power, some for weeks, due to downed power lines and power poles. HELCO estimates that it spent $13M responding to damage from Iselle, and has spent additional millions of dollars in repairs of lines and poles after high wind events in the last few years.
How to Keep Your Systems Records Safe

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Abstract: The success of an institution depends on its ability to acquire accurate and timely data about its operations, to manage and use this data effectively. Computer laboratory record management plays a vital role in the organization and maintenance of computers in an institution. In existing system of Mehran University of Engineering and Technology, Jamshoro lab assistants are responsible to view the current status and configuration of individual computers in LAN based computer labs. The other and very important problem which lab assistants face is that they don’t know automatically which hardware and software changes are being done on any system. In this paper a Computer Laboratory Record Management System (CLRMS) is proposed to avoid such kind of problems. CLRMS is a network based Software which automatically keeps all the information of system including hardware and software. This software secures the records of system configuration for future information reporting, user management and security management. It also updates system database if any hardware is removed or any software changes occur via automatically retrieval method. CLRMS interfaces are easily understandable hence user friendly. It generates reports for both software and hardware. It shows complete structured configuration of a computer. It will keep records that which type of user was log on the system and what tasks he has performed like installation information of software, updates of software, version and vendor information.

Keywords: hardware, software, information, .NET, SQL, configuration management, computer lab, system, security, records, RMI.
Expected Residual Lifetime Based Ad Hoc On-demand Multipath Routing Protocol (ERLAOMDV) in Mobile Ad Hoc Networks

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Abstract: Nodes in ad hoc networks have limited battery power. So, it is crucial to save energy in this kind of networks. Among various multipath protocols, Ad hoc On-demand Multipath Distance Vector (AOMDV) routing algorithm is a standard one. Among the recent advancements to AOMDV, MMRE-AOMDV (Minimal Maximal Nodal Residual Energy – AOMDV) is state-of-the-art from the perspective of energy efficiency. In this article, we propose ERL-AOMDV which investigates deeper than residual energy of nodes. What it emphasizes is that expected residual lifetime of nodes and approximate completion time of a communication session are important to elect optimum routes. First three optimum routes are used for transferring data packets. Simulations results show that ERL-AOMDV performs significantly better than ordinary AOMDV and MMRE-AOMDV.

Keywords: Ad hoc networks, AOMDV, Energy Efficiency, Expected Residual Lifetime, Multipath.
Analysis of Cooling Performance of Automobile Radiator Using nano–fluid

\( \text{Al}_2\text{O}_3 \) and water

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Abstract: This paper aims to increase the heat transfer rate of the coolant with the help of nano particles (\( \text{Al}_2\text{O}_3 \)). It further increased the efficiency of the radiator, coolant & the engine. The best proportion of flow rate and concentration of nanoparticles (\( \text{Al}_2\text{O}_3 \)) have been achieved to maximize the heat transfer rate of the coolant. The proposed model of radiator test rig consists of radiator (1000cc) enclosed in a duct of GI sheet of 18 gauge. A centrifugal pump was used for the circulation of nano-fluid in the radiator tubes. PT-100 sensors were used for checking the temperature at different points of the radiator in the radiator test rig & a laboratory thermometer was employed for checking the coolant temperature in the reservoir. The coolant and the nanoparticles were well stirred with the help of an agitator (hand grinder) to make a homogeneous mixture. The coolant when circulated at different flow rates and concentration through the radiator tubes, the max heat transfer rate was obtained at a flow rate of 4lt/min & 0.15% concentration of \( \text{Al}_2\text{O}_3 \).
SOLAR BASED CONTROLLER DESIGNING FOR STARTING & SPEED
CONTROL OF INDUCTION MOTOR

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Abstract This paper describes the implementation of Solar Based Controller which is designed to control the starting (in rush) current and speed of Induction Motor. The motor in starting causes I2R losses due to heavy starting (inrush) current that will overheat the motor and also may damage the motor windings. Despite the fact, many countries are currently facing the threatening problems of load shedding because of fluctuation of oil prices, faulty distribution system, aging of equipment, and mismanagement of resources, economic & political Instability etc. This issue has been very devastating for the national economy as the industries are being adversely affected due to this drastic short fall. Accordingly, in this design we have used solar energy to feed our system & starting (in rush) current is controlled by using Star-Delta technique. In Star-Delta technique, first motor will run in star connection & then in delta and overall process of switching is done through PLC (S7200), the line current drawn with star connection initially is decreased to one- third of starting current as compared with the windings linked directly in delta. Speed of motor is controlled by altering the applied frequency and voltage from inverter to maintain different loads. The cost effective & robust system designed was successfully experimented so as to implement it in industries where motors are widely operated like (Coalmines, Chemical, Textile, Cement, Sugar mills) etc.

Keywords: Induction motor, Star-Delta Controller, Solar panel, Inverter, PLC S7200, ladder logic.
Analysis of Cooling Performance of Automobile Radiator Using Nano-fluid TiO$_2$ and water

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ABSTRACT: The main objective of this paper is to analyse the heat carrying capacity of the coolant used in the radiator of an automobile by using Nano-particle titanium oxide (TiO$_2$). The heat carrying capacity of the coolant can be increased as compared to that of conventional coolant (water) by adding TiO$_2$ as a coolant [1]. The experiment was conducted by varying the concentrations of the Nano-particle TiO$_2$ in water at three different flow rates. The concentration of the TiO$_2$ varies from 0.1% to 0.2% and the flow rate of the Nano-coolant has been kept in between 2lt/min to 4lt/min. The observations were made within a temperature range of 50oc – 30oc to analyze the effect of fluid inlet temperature on the heat transfer coefficient. The test rig consist of radiator of capacity 1000cc, ducts made up of Galvanized iron sheet of thickness 20 gauge, a pump employed for the continuous circulation of the coolant, 4 temperature sensors[2] to check temperature at different section of the radiator(inlet, outlet, wall1 i.e. front side,wall2 i.e. rear side), a hand blender used for mixing of Nano-particles with water and an immersion rod to increase the temperature of the coolant to 500c. The best results were obtained when the coolant was circulated at flow rate of 3.4lt/min at 0.15%volume concentration of TiO$_2$ in water.

Keywords- Heat transfer coefficient, Nano-fluid, Convection, conduction, nusselt number, and Reynolds number
Voltage Source Inverter based Static Compensator for Current Harmonic Mitigation and Power Factor Improvement of Three-phase Six Pulse Converters

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Abstract: Electrical power system consists of majority of inductive loads. Nowadays, electrical industry deals with power electronics based devices which can produce sufficient reactive power. Transformers and motors are used in access to power system for working which makes phase difference between electrical variables (voltage and current) which results in behaving the system power factor less than unity. Power electronic converters such as (GTO, IGBT, MOSFET) and also excessively used in various non-linear devices such as electric arc furnace and therefore results in the poor quality of power supply [1]. Electric arc furnaces operation produces voltage flicker and harmonics known as fundamental problems related to quality of power supply. The purpose of the power quality is to maintain the electrical wave shape of grid system voltage bus at rated magnitude of voltage and frequency. Electrical arc furnace is fed by AC supply system either single-phase or three-phase system with high magnitude. Arc is produced from electrodes by a high current which generate the heat up to the temperature if 3000°C used for melting and refining purpose. Arc furnaces have timevarying characteristics with active and reactive power fluctuating consumptions. Arc furnaces consumes more electrical current when voltage is decreased in order to maintain the same torque, that’s why input power to the furnace is exposed to sensitive voltage variations [2-3]. Most of the inductive loads in the low voltage AC system use single-phase rectifier or three-phase rectifiers. These converters have non-linear characteristics (voltage and current are not in phase) give dangerous effects on input of utility mains and also on load side. Apart from arc furnaces, the high frequency switching converters are used in wind energy generation in compliance with power quality standards. Since, wind power is based on AC power, therefore it is vulnerable to variation in supply frequency. As a matter of fact, they can inject harmonics to the grid side creating major power quality issues [4].
Sign Language e-Learning system for hearing-impaired community of Pakistan

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Abstract: An increasing number of ratios in illness and injuries has lead to increase in the number of disabled people at the early age of birth. In this work we presented a web based e-learning system that is completely concerned with the sign language. In Pakistan, there is a scarcity of sign language resources available to assist deaf children in strengthening the language skills necessary for academic advancement. Thus, eLearning for hearing impaired people is an application developed not only for deaf children but also for normal people to communicate with the deaf people. It is a web based application focusing on sign language of Pakistan which allows nonvocal information exchange. The purpose of this research work is twofold. First is to provide an e-learning system for educating sign language to deaf/hard-of-hearing people of Pakistan. Secondly, to develop a text translation system to translate English into its equivalent Pakistani sign language gestures in order to overcome communication barriers. The system also contains feedback for improving the quality of application by taking suggestions from normal and disable people. The proposed application is distributed in modular client server entities; the framework is specially designed for parents to edify their children the indispensable communication skills. We believe that proper communication lays the foundation for accelerated learning and reduced frustration.

Keywords: Impaired, Deaf, Pakistan Sign Language, e-learning, Disable.
**Electrical Impedance Plethysmography Based Telemetry System Used to Detect the Pulse Rate from the Radial Artery**

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**Abstract:** Electrical Impedance Plethysmography (EIP) is a technique that can be used to detect the pulse rate of the heart from the wrist. Specialized training is required for the exact placement of electrodes to acquire the ECG signal. The advantage of this technique over ECG is that the pulse rate can be acquired using only one hand. One of the important aspects of EIP is the size, inter-distance, and placement of the electrodes. This research investigated the design and implementation of a system which could be used to detect the pulse rate from the wrist of a hand. It also shows the implementation of the low power wireless telemetry system used to transmit the EIP signals to the computer. The proposed system injected a current of 450 μA through the wrist, which was lesser than that of others systems.

**Keywords:** Electrical Impedance, Wrist, Heart rate, Telemetry.
Impact of Ethylene Glycol on Fractionalized Micropolar Nanofluid over Oscillating Plate via Caputo-Fabrizio Fractional Operator

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Abstract: This research article investigates an unsteady flow of micropolar nanofluids on an infinite oscillating plate. Ethylene glycol is considered as a conventional base fluid as well as copper and silver are nanoparticles. Two kinds of nanoparticles (copper and silver) are suspended in ethylene glycol. The governing partial differential equations are fractionalized in terms Caputo-Fabrizio fractional derivative and solved by analytical approach. The general solutions have been established for temperature distribution, microrotation and velocity field by employing integral transforms (Laplace transform) and expressed in terms generalized Fox-H function. The general solutions and their limiting cases rectify the initial and boundary conditions. Finally, the impacts of nanoparticles, Caputo-Fabrizio fractional operator, dimensionless numbers, material parameters and rheological parameters have been underlined by graphical illustrations on flow.

Key word: Micropolar nanofluids, Caputo-Fabrizio Fractional Derivative, generalized Fox-H function, nanoparticles, and Rheological parameters.
A choice of symmetric cryptographic algorithms based on multi-criteria analysis
approach for securing Smart grid

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Abstract: In order to optimize production, consumption and distribution of energy, the
different devices of a smart grid (SG) exchange daily increasing flows of information.
Moreover, SG produces much more data stream than the traditional network. In
addition to the large volume, the data of the SG are characterized by their diversity.
However, securing these data flows is essential. Indeed, a single failure or attack could
compromise the safety of the whole electrical network, the malfunction of which could
have serious repercussions. Therefore, cryptography as a solution is necessary for SG
to become realizable and secure. Being able to classify and to make a good choice of
symmetric cryptographic algorithms for security of SG, we proposed to use an
approach based on multi-criteria analysis.

Keywords: Smart Grid, Security, Cryptography, Confidentiality, multi-criteria
analysis, PROMETHEE, GAIA.
Simulative Investigation of Transmission Performance for Proposed NG-PON 2

Based on DPQSK Modulated Downstream with Two different Intensity

Modulated Upstreams

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Abstract: We present a comparison between the two high data rate next generation passive optical network (NG-PON 2) which are feasible to fulfill the future demand for bandwidth hungry applications that exceeds beyond 10Gbps. This paper summarizes the best suitable network for future bandwidth hungry applications by simulating both networks through optisys simulated software considering standard values and recommendations for NGPON 2. Both networks support 40Gbps with Differential Quadrature Phase Shift Keying (DQPSK) while at upstream one network supports 10Gbps with On Off Keying (OOK) and other support Inverted return to zero (IRZ) with 10Km fiber span. Comparison of both networks transmission performance in terms of BER with Rx power and OSNR has been investigated and results shows that NG-PON 2 support 40Gbps with DQPSK and 10Gbps IRZ is quite better than other network with higher sensitivity and OSNR.

Keywords: Differential Quadrature Phase Shift Keying (DQPSK), ON-OFF Keying (OOK), Inverted Return to Zero (IRZ), Next Generation Passive Optical Network-2 (NGPON-2), Bit Error Rate (BER), Optical Signal to Noise Ratio (OSNR).
MOEMS Based Accelerometer Sensor Using Photonic Crystal for Vibration Monitoring in Automotive Systems

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Abstract Diagnosing the vibration in automobiles has got great priority since it provides comfort to the passenger inside vehicle. This paper presents MOEMS accelerometer sensor by using photonic crystal. Spring mass system with photonic crystal technology is visualized and scrutinized. Optical sensing system with photonic crystal technology studied and simulated with rods in air and holes in slab configuration. Due to applied force deflection of rectangular defect slab for vertical and horizontal movement is verified. Gaussian pulse propagated through the defect region in photonic crystal slab was resulting wavelength shift for each deflection of slab. Transmission spectrum obtained for each deflection direction of slab and configurations. Q factor analyzed for each displacement of slab found to be 3210 for HIS vertical movement. It is found that distinct change in wavelength has obtained for Holes in slab configuration during vertical and horizontal movement of slab compared to the results of Rods in air configuration. Obtained results showed feasibility of future fabrication for HIS configuration.

Keywords: Photonic crystal, Accelerometer, Rods in Air (RIA), Holes in slab (HIS), Vibration, Micro displacement, Light Propagation, Q-factor, Monitoring, MOEMS.
Photonic Crystal Based Micro Interferometer Biochip (PC-IMRR) for Early Stage Detection of Melanoma

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Abstract: The paper describes a unique approach for the label free biosensor design for the early stage detection of malignant and invasive melanoma. Refractive Index variation analysis plays a vital role in the Photonic Crystal based sensor design. The Photonic Crystal based micro interferometer biosensor has been designed in rods in air configuration. The design comprises of a hexagonal ring structure between two bus waveguides forming a sensing and reference arms. The early stage diagnosis of Melanoma is dependent on the comparison of the normal cell against the affected cell which is done by using the arms of interferometer. The sensitivity of the biosensor is determined by the phase shift / wavelength difference between the arms of the interferometer sensor. The sensitivity of the designed sensor is 4000nm/RIU. The simulations are based on FDTD technique. The relative shifts in frequency and wavelength is due to the Refractive Index deviation in the sensing arm. Quality Factor obtained at 10654.3 for wavelength 1550nm.

Keywords: Melanoma, Interferometer, Refractive Index deviation, FDTD, sensitivity, Quality factor
Gesture Controlled Robotic Arm Using Leap Motion

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Abstract: Robot plays a vital part in making our lives more facile. The scope of this paper is to provide a relation between human and machine by the interaction of human hand and robotic arm. The idea converges towards the conception of a robotic arm identical to human hand with gesture that is more precise. The arm consists of five Degree Of Freedom (DOF) and an end effector, which allows the interaction with the real world. The construction of the robotic arm adapts the principles of inverse kinematics and torque equilibrium. Now the obligations for the controller arise and along the way settled with the exploration of leap motion sensor. As earlier, robotic arm was controlled by the keypad or joystick which required a lot of practices and calculations to manipulate the robotic arm to reach desired position. The exploitation of the leap motion results in explicitly acquiring for hand gesture and provides set of points. This innovation enables more perceptive five DOF control with an end effector. The results showed the reduction in the complexity approach and gain in control accuracy.

Keywords: Gesture Control, Leap Motion, Robotic Arm, Forward Kine
A LEXICON BASED MECHANISM FOR IDENTIFYING AND MONITORING SECURITY THREATS ON ROADS

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Abstract: Given the booming expansion of social media, it is not surprising that the field of sentiment analysis has seen advancements rapidly in recent years. Nevertheless, the use of sentiment analysis is quite limited in the field of transportation to assess the safety of an area. This research paper propose the sentiment analysis of traffic or crime information as a new way to handle this problem. To achieve this, we have used one of the user generated contents i.e. Twitter as our source of information. Twitter has emerged as an essential new tool to make social measurements. Millions of tweets express their thoughts and sentiments about any topic imaginable on daily basis voluntarily. This heap of data is quite significant from both research and business perspectives. Thus, we intend to design an application through our research with which the categorization of data publically available at Twitter can be done, so that the users can have access to the customized and useful information related to the areas they are planning to visit. To carry out this research practically, data from Twitter was collected for a particular source and destination and sentiment analysis was performed using SentiWordNet. The result yielded in overall polarity of the tweets informing users about the safety of all the available routes. This study will help greatly in the development of intelligent transportation systems and our experimental results demonstrate the effectiveness of the system.

Keywords: sentiment; polarity; safety; lexicon
Data Mining and Machine Learning for Financial Analysis

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Abstract Data mining is the process of discovering patterns, corresponding to valuable information from the large data sets, involving methods at the intersection of machine learning, statistics and database systems. Evolving from the fields of pattern recognition and artificial intelligence, machine learning explores the study and construction of algorithms that can learn from sample inputs. This paper describes several (data mining)/(machine learning) techniques for financial analysis focused on risk management (particularly credit scoring and bankruptcy prediction). Financial data analysis is used in many financial institutes for accurate analysis of consumer data to find defaulter, reduce the manual errors involved, fast and save time processing, reduce the misjudgments, classify the customers directly and reduce the loss of the financial institutions. We have considered a lot of various machine learning techniques for financial data analysis as those applied for supervised classification (Artificial Neural Networks, Support Vector Machine, Decision Trees) as well as those used for clustering (K-means clustering).

Keywords: Data mining, machine learning, financial analysis, risk management, bankruptcy prediction, credit risk, credit scoring, artificial neural networks, classification, clustering.
Numerical Investigation on the Damage Initiation and Stiffness Degradation in Matrix Materials Attaching an Aggregate to the Hot Mix Asphalt

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Abstract In this paper, numerical simulations have been carried out to investigate about damage in matrix materials. It is known that hot mix asphalt is a heterogonous material composed of aggregates, matrix and air voids. The matrix is the phase which links the coarse aggregates and it is comprised of fillers and bitumen. The numerical model has been represented by one rectangular aggregate, which is in contact to the hot mix asphalt thanks to the matrix. The matrix has been considered as a cohesive element between aggregate and hot mix asphalt. The applied displacement has been related to the speed of vehicle. A comparative analysis between four matrix types has been conducted. The effect of loading and fillers on the damage initiation and stiffness degradation in matrix material will be shown.

Keywords: Numerical simulation, hot mix asphalt, damage initiation, stiffness degradation, matrix, cohesive element, adhesive damage.
Wireless Sensor Network (WSN) Based Early Flood Warning System

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Abstract: Water is one of the most essential and necessary element that we require in our daily life, although it may become life threatening for the people living near to the river bank. In many cities of Pakistan, controlling the flood situation is a major problem. Due to the poor management and lack of dams, the chances of flood may increase exponentially. First priority is to save the lives of the people living close to the river bank, hence technology can play an important role in this regard to solve this problem at some extent. We proposed a Wireless Sensor Network (WSN) based system to warn the nearby villages about the impending flood situation so they may take precautionary step to save their lives. We introduced four nodes for four different river locations to constantly monitor the flow and the level of the river water. These four nodes will deliver their information to a master node holding all the necessary information and will generate a warning in case of flood.

Keywords: Wireless Sensor Node (WSN), Flow Sensors, Arduino MEGA 2560.
AUTONOMOUS SLAM BASED FORKLIFT ROBOT

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Abstract—This paper proposes and develop a sophisticated design of Autonomous Simultaneous Localization and Mapping (SLAM) based Forklift Robot for lifting the user defined objects in warehouses. The main idea of this work is to design such an object lifting forklift robot which works in dynamic and unknown environment to lift and shift the boxes from one place to another. Because the forklift robot is a SLAM base so it has the ability to empower the controller of the robot to take decisions related to the movement of the robot on its own without any human intervention. In SLAM based Forklift Robot involves both Simultaneous Localization and Mapping to move the robot to reach the object for detection and lifting. For object detection this paper describes the machine learning approach which is Optical Character Recognition (OCR) in which we use K-nearest principle to detect the user define object (box). Then the forklift robot match the alphanumeric code written on the box with the code which is defined by the user by using OCR to detect and lift that box. So basically our design follows three basic steps: the forward motion planning which is the part of SLAM approach for navigation in forward direction and also generating a real time map. The second step is object detection by using optical character recognition. The third step is reverse motion planning which follows the map which was generated during the forward motion planning to get back its starting or initial position with the box. This map is also display on the user’s interface wirelessly. The above approach has been practically implemented with a robust map generating and character recognition capacity.

Keyword: Simultaneous Localization and Mapping, Forward Motion Planning, Reverse Motion Planning, Optical Character Recognition, Object Detection.
Multiphase Flow Control with Embedded System and Color Image Processing

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Abstract: In Oil and Gas Industry, Multiphase Flow of Oil, Gas and Water is present during exploration, transmission, refining process. Finding the content of oil, gas and water is very important for decision making of exploration, transmission and refining process. Using mechanical instruments is not very efficient, as they are bulky, expensive and not very accurate, so using electronic instruments with embedded system and sensors will capture the image of fluid and then converting that image to digital form. Once the image in digital form, we applied image processing technics of de-blurring to increase the accuracy and then calculating the pixels of oil, gas and water to find content profile. Installing these sensors at two points is used to find velocity profile of fluid. We have successfully fabricated multiphase flow metering (MFM) system using local resources. This system is designed to study the application of wire mesh tomography and for capturing image data of multiphase flow of fluids with the help of embedded system and used de-blurring algorithm of image processing, to increase accuracy of content profile and correlation technique was applied to find velocity profile, then with color image processing techniques, content profile of oil, gas and water was calculated to see that calculation of oil, gas and water are the same and verified as it was obtained from the image processing and de-blurring techniques. Results obtained were quite encouraging.

Keywords: Multiphase Flow Control, Embedded System, Image Processing, Deblurring, Correlation
Altitude Controlling and Trajectory tracking of Quadrotor UAV by using Model Predictive Control

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Abstract: In this paper, Model Predictive Controller (MPC) scheme is proposed to stabilize the desired altitude and attitude of the Quadrotor-Unmanned Aerial Vehicle (Q-UAV). The proposed control strategy uses control input as a reference which is utilized to track the referred trajectory, such that the linear and angular velocities which are used to derive the model of the Q-UAV. MPC is used as a main controller to control the dynamics of Q-UAV, while the nonlinear behavior and stability of the underactuated Q-UAV is dealt by Extended Kalman Filter (EKF), which is also used for the accurate prediction in MPC. The proposed control strategy is verified by using multiple simulations in Simulink MATLAB. The efficiency of the proposed controller is compared with Proportional Integral Derivative (PID) controller. It shows that it exhibits minimum steady state errors and fast error convergence in the presence of model uncertainties.

Keywords: Model Predictive Control (MPC), Extended Kalman Filter (EKF) and Quad-rotor Unmanned Aerial Vehicle (QUAV).
Mitigation Strategies for Unintentional Insider Threats on Information Leaks

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Abstract: Information leakage is a major concern for many organizations. Information leakage becomes critical when the perpetrator is an insider. One often overlooked cause of security breach is unintentional human behaviour in daily activities in an organization. Human behaviour that poses a critical issue in any organization includes human error, omitted security behaviour and the practice of security shadow IT. These unintentional acts are an important source of risk to information assets especially with the current challenges brought by the social media phenomena, Bring Your Own Devices (BYOD) to office, and social engineering attacks. It is acknowledged that technology alone cannot guarantee a secure environment for information assets. Appropriate risk analysis, monitoring and auditing of technology, organizational culture, people and procedures are crucial strategies in conducting information security management. This paper aimed to identify human errors and behavioural activities in daily job activities that are exposed to current security breaches. The mitigation strategies for current threats posed by unintentional insider activities discussed in this paper attempt to shed some light for both, academics and practitioners.

Keywords: Unintentional Insider threat; omissive security behaviour; human behaviour; information leaks.
Power Budget Analysis of Proposed High Data Rate Based Next Generation PON 2 Architecture Supporting High Split Ratio

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Abstract: To cope up with the challenges of high data rate transmission techniques in access networks, we have proposed and analyzed an NGPON 2 based architecture, which can support 40Gbps transmission employing Differential Quadrature Phase Shift Keying (DQPSK) modulation in downstream with 10Gbps transmission having Inverse Return-to-Zero (IRZ) modulation in upstream. The proposed design has been thoroughly analyzed under standard transmission parameters in simulation for NGPON 2 network. Transmission performance has been investigated on the basis of Bit error rate (BER) at receiver and power budget analysis through received power at different transmission stages in proposed design at 10 Km fiber. It is evident from results that proposed design is a feasible solution for high data rate transmission with large power splitting ratio which are ultimate demands in next generation access technology.

Keywords: NG-PON2, DQPSK, IRZ, FBG
A Standard Methodology to Assign Cognitive Weights to Compute the Cognitive Complexity of a Software

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Abstract Cognitive complexity of a software determines how the human brain can identifies the internal logic of the source code, which is a subjective measurement. Although it has been computed through assigning cognitive weights to each piece of information, which they are not validated through a standard methodology. In this paper, the cognitive weight distribution and their relation with respective to the Basic Control Structures have been analyzed with a questionnaire given to different user categories. Furthermore, possible factors which affect to compute the cognitive complexity has been discussed, which does not limit only up to the amount of information in the given software.

Keywords: Cognitive complexity, Cognitive weights, Basic Control Structures, Software, Source code
Behavior study of SIP on IP Multimedia Subsystem architecture
MPLS as Transport Layer

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Abstract: IP Multimedia Subsystem "IMS" is the modular architecture that provides
users with reliable access to multimedia services (voice, video conferencing,
interactive services, etc.). However, quality of service (QoS) and security are one of
the main concerns of operators when it comes to multimedia services. The
MultiProtocol Label Switching (MPLS) protocol ensures these two basic needs. IMS
is primarily based on the Session Initiation Protocol (SIP) for (i) routing, (ii)
establishing, (iii) modifying, and (iv) closing a multimedia session. The SIP protocol
represents the most influential protocol in the IMS architecture. The objective of this
paper is to evaluate the performance of the SIP protocols in an IMS architecture with
the MPLS protocol as the transport layer protocol. The evaluation will focus on: (I) the
impact of the number of connections on the duration of SIP session establishment and
(Ii) the impact of the number of users on the performances of IMS services (VOIP and
Videoconferencing).

Keywords: IMS; NGN; MPLS; SIP; Multimedia networks
Fog Computing and Internet of Things: Architecture, Applications and Challenges

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Abstract Internet of Things (IoT) is a network of interconnected physical devices and sensors around us. It has the power to bring so many innovations in this world which can enhance the quality of life. However, it generates a sheer amount of data which makes it difficult for the existing systems like edge and cloud computing to handle. Fog Computing system is an emerging concept that brings storage, computation and communication near the end user. It extends the cloud computing system by providing virtualization and location aware resources to the users with a special focus on latency. In this paper, the limitations of the previous computing systems and the characteristics of the Fog Computing system are discussed. An architecture for the system is also discussed along with its wide range of possible applications in the IoT paradigm. The discussion is then further extended towards a detailed analysis of the feasibility of the new system considering its reliability. Lastly, the main challenges faced by this system are highlighted and future research directions for the new computing system are also outlined.

Keywords: Fog Computing, Internet of Things, Cloud Computing, Edge Computing, Fog, IoT
LAA based LBT Adaptive Channel Access Methods for LTE-U systems

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Abstract: Long Term Evolution (LTE) system is confronted with more data rate challenging services and growing amount of mobile phones are looking to exploit the license free bands which is currently used by Wi-Fi. In this paper, we estimate a performance of the two recently proposed 3GPP MAC and Wi-Fi-based methods under varied scenario by various parameter configurations. Then assessment can carried out during simulation and measured parameters such as Jain’s fairness index (FI) and access opportunities attained following multi-competitions on shared channel. In addition, proposed two MAC methods transferred to as improved LBE (E-LBE) also improved FBE (E-FBE) and appraise and evaluate their performance by 3GPP MAC methods.

Keywords: LTE-U system, LBE, FBE and Jain’s fairness index
A Logging Scheme for Reducing Update Workloads in Flash Storage

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Abstract By caching dirty pages in memory space of the buffering pool, a database system can reduce physical I/O’s required for page updates. If any dirty page has constant updates on itself, it can stay long in the buffering pool without being flushed. Although the existence of such aged dirty pages can reduce updates in storage, it is apt to prolong the time for recovery after system failure. To prevent delayed recovery times, many database systems take an approach flushing aged dirty pages in a background mode. Even though the approach may be beneficial in the case of HDD storage this may not be the case for flash storage because of its high update cost. To solve the problem in flash, we proposed a new logging scheme and a recovery algorithm working with it. Since aged dirty pages in our method are written into a log file, rather than into data area in storage, we can evade updating of them. To reduce the size of log data to be written for that purpose, our logging scheme writes a small size of snapshot log. Since the write of a snapshot log record can put the redo start point forwards, we can guarantee the fast recovery time, without update operations. Due to reduced update workloads, our method can improve the overall throughput of flash storage

Keywords: flash memory, database recovery, logging algorithm, storage system
**Qualified Analysis of DSMC over SMC for Boost Converter**

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**Abstract** A qualified analysis of Discrete Sliding Mode Controller (DSMC) over Sliding Mode Controller (SMC) for dc-dc boost Converter is described. The system is first designed with SMC with inner current loop and outer voltage loop control, secondly with the help of sample and hold circuit parameters are sampled and DSMC is used to regulate the output voltage. Both the cases output voltage is regulated and their response is analyzed for the step change in input to prove robustness of the controller. The main aim is to analyze the boost converter to prove its voltage regulation, to prove the robustness of the controller by giving step input, to obtain improved rate of response with better efficiency and to overcome the chattering phenomenon. The implementation of DSMC is simple which eliminates the requirement of ADC and has flexible control characteristics for parameter variation so that the overall system is efficient & cost-effective.

**Keywords:** Discrete Sliding Mode Controller, Sliding Mode Controller, DC-DC Converter, Boost Converter.
Wavelength selectivity using Adaptive Shortest Path Algorithm for optical Network

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Abstract: Routing problem and wavelength Assignment problem is found in the dynamic all optical Network which plays a very important role for the optical Transport layer Network and it is solved by minimizing the connection blocking since the grooming adaptive shortest path algorithm shows the comparably better results in terms of the calculation to find blocking probability. The shortest path algorithm used in this paper contains the present network state information and each node creates a shortest path tree towards the all other nodes which forms a node pair by connecting each branch in the tree. Adaptive Shortest Path Algorithm will find the shortest path throughout the network path and it chooses the best path from the available sourcedestination. Considering the number of nodes as 14 and comparing for different topology it has been observed that the wavelength usage in each node varies with respect to different topology. Additionally a comparative study of Wavelength usage has been achieved for topologies like Random, Ring and Tree.

Keywords: Adaptive Shortest Path Algorithm, Blocking Probability, Topology, Wavelength assignment
Learning Path Personalization According to the Learning Styles and Knowledge Level

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Abstract The Traditional pedagogical approaches of learning are mostly instructor centered. Since the students or the learners are individually in different knowledge levels, often, they are unable to obtain the effective usage of the teaching methods to improve their knowledge alike. Although the interactive mechanisms are presented with modern e learning solutions, mechanisms on paying concentration on the delivery of learning materials targeting on each individual student separately for equal knowledge distribution are very rare. As a solution to distribute the learning process in a way to obtain the knowledge by the students equally, this research is carried out to personalize the learning material delivery among the individual students according to their own static and dynamic learning behaviors and the current knowledge level. The main objective is to recursively personalize the learning path according to the dynamically changing learning styles of the student for continuous delivery of learning materials and evaluation of their performance until the expected lesson objectives are satisfied by the student.

Keywords: Learning Behavior, Learning Personalization, Objective Setting.
Scaling of Supply Voltage in Design of Energy Saver FIR Filter on 28nm FPGA

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Abstract—In this work, we are going to analyze the effect of main supply voltage, auxiliary supply voltage, local voltage of different power bank, and supply voltage in GTX transceiver and BRAM on power dissipation of our FIR design using Verilog during implementation on 28nm FPGA. We have also taken three different level of voltage with 16 IO standards and we get three different power analysis for each IO Standards. IO power dissipation of FIR filter is 150mW with SSTL_18_II IO standard. When we migrate our design with HSTL_1, HSUL_12, LVCMOS15, LVTTL, MOBILE_DDR, and PCI33_3 IO standards then there is 53.33%, 86%, 90.67%, 65.33%, 52%, and 48.67% reduction in IO power dissipation of FIR Filter design on CSG324 package of Artix-7 FPGA family.

Keywords—Supply Voltage, Input Voltage, Output Voltage, Auxiliary Voltage, Power Dissipation, Energy Efficient, FIR Filter
**Design of Energy Efficient Receiver and Transmitter for Optical Communication**

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**Abstract.** In the past, the modes of communication were wired, wireless and then came optical fiber communication into scenario. Nowadays, a new technology have been introduced known as Free Space Optics (FSO) that uses line of sight technology which uses lasers and photo detectors to provide optical connection. In this paper, the main aim of the author is to design an energy efficient transceiver for wireless optical communication. This paper consists of a transceiver design that is implemented on Xilinx ISE Design Suite 14.2 and results were tested on 28nm FPGA platform that is Kintex-7. Our design is based on 28nm FPGA and the device used is XC7K160T, package used is FBG676 and it is working on -3 speed grade. The advantages of FSO over fibre are it provides unlimited bandwidth, freedom from licensing, speed is very high, and high bit rate. Nowadays, bit rate is 2.5Gbps and in future it is expected to be 10Gbps. In this paper frequency scaling technique is used and frequency is varied to obtain power consumption of the Transceiver. Airflow has been kept 250 LFM and medium Heat sink. Power has been analyzed at different temperature range. At the end it can conclude that the maximum power consumption is at 2.2 GHz frequency and minimum power consumption is at 1.2 GHz. In terms of temperature maximum power is consumed at 56.7oC and minimum is consumed at 21oC.

**Keywords:** Energy Efficient, Free Space Optical Communication, FPGA, Transmitter, Receiver
**Wireless Power Transmission System Using Magnetic Resonant Coupling to Operate Low Power Devices**

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**Abstract**— In recent years technology is evolving day by day and it has changed the entire world. Wireless Transmission of power is a kind of a technology that is used to power the device without a wire and it is useful where electrical wires are hazardous or inconvenient. This technology is compatible for reducing heavy line loses. In our proposed work, we have designed a system based on transmission of power wirelessly to operate electronic devices such as mobile phone, laptop, LED bulbs, etc. through magnetic resonant coupling. We used two coil one is transmitter and other is receiver magnetic flux is generated this causes EMF is induced in receiving coil. Magnetic resonance coupling is a phenomenon where transfer of power is highly efficient between the transmitter and receiver. In conventional inductive coupling, efficiency drops off.

**Keywords**— Two coils, Magnetic resonance coupling, Royer oscillator, voltage regulator.
A fast and efficient image indexing and search system based on color and texture features

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Abstract Content-Based Image Retrieval (CBIR) allows to automatically extracting target images according to objective visual contents of the image itself. Representation of visual features and similarity match are important issues in CBIR. Color, texture and shape information have been the primitive image descriptors in content-based image retrieval systems. This paper presents a fast and efficient image indexing and search system based on color and texture features. The color features are represented by combines 2-D histogram and statistical moments and texture features are represented by combines the direction measure and a gray level co-occurrence matrix (GLCM). The detailed experimental analysis is carried out using precision and recall on dataset Wang. The time analysis is also performed to compare processing speeds of the proposed method with the existing similar best. The experimental results demonstrated that proposed method achieved a better image recognition, and the accuracy of classification based on this method has been significantly improved. The performance is measured in terms of recall and precision; also the obtained performances are compared with several state-of-the-art algorithms and showed that our algorithm is simple, fast, and efficient in terms of results and memory.

Keywords: Co-occurrence matrix; GLCM; Direction measure; 2-D histogram; Statistical moments; CBIR.
Predicting Sentence Using N-Gram Language Model for Nepali Text

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Abstract: Sentence completion is a real time ubiquitous feature directed to predict a succeeding words sequence, inappropriate completion of a given initial text fragment. With the system having sentence completion features, user can retrieve desired information with little knowledge over exact keywords and with least typing efforts. This work deals with N-gram method to predict the remaining part of sentence for Nepali language using Viterbi as a decoding algorithm under statistical method. Bigram and trigram language models are experimented and result is analyzed. As a result, it is observed that Trigram Prediction Model outperforms the Bigram Prediction Model with 17.3% higher accuracy. However, the time complexity to train the trigram model is comparatively greater than that of bigram. To get even better result, this work recommends taking a large corpus with sufficient repetition of words.

Keywords: NLP, Information Retrieval Sentence Predication, Viterbi algorithm, Ngram and Nepali language model
Design and Implementation of Gaussian Filter for de-noising an image with Different Mask Sizes on FPGA

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Abstract: In this paper, a clean input image is considered. It is subjected to different percentages of noisy image is recovered by passing the image through a Gaussian filter 7X7 size. A sliding window designed here is of format according to the mask dimension. A logarithm multiplier is designed for the convolution of image and mask. After designing the filter with all features mentioned above in Xilinx it is implemented on the FPGA using System Generator tool 24]. Input image is directly given to the black box through input blocks of system generator and read through output blocks of system generator. This mask is made to slide image is obtained. Performance of the filter is analyzed by subjecting the filter for difference mean and variance values. The paper is implemented by using the MATLAB software.

Keywords: Salt and Pepper noise [3,4,5]
**Chaser Robot Using Microsoft Kinect Sensor**

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**Abstract**
Intelligent robots have developed enormously in the last few years and have been progressively helping human beings to perform tasks ranging from household to industrial. Scientists and researchers are carrying out various experiments throughout the world every day to make a robot which would one day act correspondingly like a human being. This paper highlights the technology of an Intelligent Human Following Robot which can be used in various applications such as a luggage carrier at Airports and as a load carrier in industrial warehouses using Microsoft Kinect Xbox360 sensor. The main goal of this research was to eliminate the need to wear a sensor or any tag by the target human in order to get tracked by the autonomous robot. So, therefore human following in this particular study was obtained by measuring depth data of human body joints using human skeletal tracking feature of the Kinect sensor. This depth data, which was unique for every human being not only enabled the robot to distinguish the target human among obstacles and other humans but also acted as a guided tool for robot to move forward, backwards, left and in right directions.

**Keywords:** Sensor Kinect, Skeletal tracking, Visual Servoing
Study of QoS efficiency in Deployment of MPLS and MPLS / DiffServ

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Abstract- The Multi-Protocol Label Switching (MPLS) protocol has contributed to the Internet routing, traffic engineering and quality of service required for new services. It would be interesting to compare the QoS performance of MPLS and MPLS / DiffServ networks, taking into account their particular constraints. In this article, we evaluated the QoS performance metrics such as delay variation, delay, response time, throughput for different traffic types (voice, data and video) for both platforms MPLS and MPLS / DiffServ. The objective is to compare the performance of MPLS and MPLS / DiffServ using "OPNET Modeler v14.5" using the latest simulation techniques, where different QoS parameters can be measured to compare the performance of networks. Our approach in this work is to design and build an operator network type of heart to simulate a real scenario that conveys different types of traffic (voice, data and video). The results of the work are presented according to the simulation time and the network load. The results of the comparison demonstrate the advantage over the performance of MPLS networks with diffserv compared to traditional MPLS networks.

Keywords: MPLS, DiffServ, Qos, NGN
Crop Monitoring System Using Raspberry Pi

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Abstract: "Agriculture is the of process of cultivation of land or soil for production purpose". Agriculture plays a very vital role for economy of Pakistan and its development. About 70% of population is relates to agriculture directly or indirectly. Its contribution towards GDP is about 25% which is higher than contribution of any other sector. Issues concerning agriculture have been always hindering the development of the country. The only solution to this problem is smart agriculture by modernizing the current traditional methods of agriculture. The purpose of this paper is to produce agriculture application of wireless sensor network that can monitor the environment in which crops are being changes that take place. These changes are unpredictable by the system and are in a sense random. The nodes in the system can measure temperature, humidity and soil moisture. The problem of excess water supply can be removed by measuring soil moisture. Crops need of water can be predict through temperature monitoring. Healthy air quality can be maintaining through monitoring air quality. Sensor node consisting AVR microcontroller and sensors. The Raspberry Pi perform as a central hub for all sensor nodes. Monitoring of crop field using WSN represents the class of network applications with more benefits to the farmers.

Keywords: Rasberry pi, WSN, AVR microcontroller
Digital and Analog Body Mass Index Calculating Device: A comparative study

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Abstract Obesity is a major concern of health risk universally, which consequently results in adverse impact on overall health. Body Mass Index (BMI) is a noninvasive method employed to measure the body fat using the individual’s weight and height. The aim of this study is to develop an automated BMI measuring device using load cells, ultrasonic sensor and PIC microcontroller. Moreover, statistical analysis to estimate the accuracy of the analog and the designed BMI instrument is presented. The height and data were collected from 18 to 75 years old random 100 subjects, 68 males and 32 females, using both analogue and designed digital prototype. The mean analog readings of weight, height and BMI of the studied population were 65.75±14.78 Kg, 1.65±0.1 m, and 23.93±4.34 Kg m-2 respectively. The analog data readings are relatively in agreement with their counterpart digital mean value of weight (62.14±12.92 Kg), height (1.58±0.093 m), and BMI (25±4.65 Kg m-2). The correlation coefficient of the designed BMI instrument and the analog readings has shown the accuracy of 97.9 % (weight), 95.1 % (height) and 97 % (BMI). In the future, the developed prototype may be employed to enhance the practical knowledge and skills for students and trainers in education and vocational institutions.

Keywords: Obesity, body mass index, load cell, ultrasonic sensor, statistical analysis.
Computational Analysis of Aircraft Impact on Concrete Panel

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Abstract The primary interest of this paper is to confirm the results of an experiment performed by Sandia National Laboratories (SNL) by conducting a computational analysis and comparing the results drawn from the analysis. With respect to aircraft impact accidents, there may be an extremely large deformation for a very short time. Therefore, the use of LS-DYNA is reasonably perceived to conduct such a computational analysis, as it is the finite element software for analyses related to large deformation and/or suddenly applied extreme loading. In this study, several interesting findings are drawn from the computational analysis results.

Keywords: Computational analysis, aircraft impact, concrete, LS-DYNA
Modeling and Simulation of the Electrical Vehicle Using Matlab and verifying it by Driving Cycles

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Abstract Electric Vehicle are enjoying more widespread customer acceptance as personal vehicle because of their performance and economy in running cost. The EV provides uncompromised utility and fuel economy benefits compared to hybrid and non-hybrid vehicles. Modelling of EV is analyzed in this paper to evaluate the performance and range of the EV. The indigenous platform MATLAB has been used to model and simulate the different scenarios of range covered by the EV by varying the accessory power associated with them. The mathematical system was further verified by simulating the standard drive cycles for different regions of the world including the standard drive cycle of U.S.A. and E.U. The simulations were carried all on Matlab with intent to further work and extend this work to the multi-dimensional platform.

Keywords: Batteries, Electric Vehicles, FUDS, SFUDS, US06 Drive Cycle, Mathematical model, WLTC drive cycle, Matlab.
Design and Analysis of High Sensitive PhC based Sensor for Methane Gas Detection

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Abstract: Inhaling toxic gases can lead to numerous respiratory problems in human. Since methane displaces oxygen as the percentage of oxygen reduces below 10 will be major drawback for human’s lives. So there is need of sensor which will be able to detect poisonous methane gas. In this manuscript we provide a prototype of 2D photonic crystal (PhC) oriented sensor for the methane gas recognition in real time. The scope of this sensor is to monitor the environment for the concentration occurrence of methane. The respective existence of the same described by plotting the relative wavelength shifts. The prototype has been tested for the air and air- methane mixture in the ratio of 10:1 and relative wavelength shifts are recorded. The obtained curves had distinct shifts. The analysis of transmission spectrum is done by using a simulation tool called Rsoft. The wavelength and amplitude observed for air without methane is 1835.1 nm and 0.6740 whereas the wavelength and observed for air with methane is observed as 1835.2 nm and 0.6691 respectively. Thus keeping these values as signatures one can easily detect methane gas in coal mines. Quality factor (Q-factor for the presented prototype is calculated of value 134837 with exhibiting the sensitivity of the order of 2888nm/RIU.

Keywords: PhC (Photonic crystal), Q factor, Toxic gas, R soft
Feasibility of Drones for the Security Surveillance of Mehran University of Engineering & Technology (MUET)

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Abstract This paper presents the feasibility analysis of using quadcopter systems for the security of the Mehran University, Jamshoro. After the terrorists’ attacks on educational and security institutions such as Army Public School Peshawar, Bacha Khan University and Police Training Center, Quetta, it is highly likely that our university can also be targeted. This University covers a large area that can be easily infiltrated by terrorists. In our work, we have surveyed the campus for possible breach sites using drones/quadcopters as a tool to provide a quick and effective way of increasing the security of the University boundaries. This paper summarizes our findings to whether or not a drone will provide fast and reliable surveillance in assistance to the University’s existing security structure.

Keywords: Drones, Security, Surveillance, Quadcopters, Safety, Institutes
Web3D lightweight learning framework for Shape retrieval based on CNN

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Abstract With the rapid development of 3D technologies, the demand of using and retrieval the 3D models became more and more urgent. In this case, it is more and more import and necessary that sketch-based 3D model retrieval. By the user hand-drawn a sketch, the system can be provided the possible list of models, then the user can select the need model from this list. Besides, with the size of model becoming huger, 3D model displaying over web browser becomes harder, not to mention, mobile internet. This paper first reviews the related content of sketch-based image retrieval and the wellknown descriptors. Then, we proposed simplification-based lightweight method for 3D shape to fastly visualize over browser based on mobile Internet environment. Besides, a CNN (Convolution neutral network)-based learning method is conducted to obtain the best view of shape. Furthermore, learning framework is presented to present the final retrieval. Besides, a feature fusion method also is used to generate a learning dictionary. Last but not least, the experiment is realized to verify the feasibility of the approach. Finally, it is compared with many state-of-the-art mainstream approaches; the result showed that the approach was viable and robustness.

Keywords: 3D; retrieval; simplification; CNN; learning
Antibiogram Development of Pyogenic Bacteria and the Evaluation of their Multi-Drug Resistance

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Abstract: The resistance of organisms to antibiotics is increasing steadily as they are becoming more resistant to newer antibiotics, such as quinolones. Doctors and nurses spread awareness of antibiotic resistance in public, and it is their duty to keep themselves updated with the latest antibiograms of commonly encountered pathogens, so that appropriate antibiotics may be provided for the treatment of infections. Different studies show consistent predictable bacterial profiles in wound infections, antibiotic resistance and capacity to adapt to changing environment, which render the pathogens a matter of concern in hospital acquired infections. Therefore, periodical monitoring of bacterial profile and their antibiotic susceptibility pattern is important. The objective of the study is to determine the commonly encountered pathogens in pus samples along with their antibiotic susceptibility patterns. Pus samples received for diagnostic microbiology were processed, and identified by standard protocols. Antibiotic susceptibility testing was done by Kirby-Bauer. Disc Diffusion method. Among the isolated organisms from pus specimens, Staphylococcus aureus was the most common followed by Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, Proteus species and Acinetobacter species. Quinolones, aminoglycosides and cephalosporins were found to be the most effective antimicrobials in vitro, whereas amoxicillin, minocycline and trimethoprim-sulphamethaxazole were least effective. Staphylococcus aureus was found to be predominant among all the bacterial isolates used in the study. All the isolates had strong resistant to antibiotics such as amoxicillin, trimethoprim-sulphamethaxazole and minocycline.

Keywords: Antimicrobials, Antibiotics, Diseases, Disinfection
The Implementation of Secure Communication in Memristor Based Chaotic Circuit

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Abstract Leon Chua discovered memristor, known as the fourth basic element or the missing link in 1971. It is a passive device with two terminals, where the magnetic flux is related to the amount of passed electric charge through the device. We used the memristor based chaotic circuits which consist of three basic elements. In this paper, we take advantage of chaotic feature of memristor and a memristor-based system is used for masking chaotic signals in communication systems with LabVIEW. Firstly, the memristor’s equations are given. Then circuits modeled with LabVIEW. The next part, the circuit which shows the chaotic specialty is implemented secure communication. Finally, simulation results confirm that the success of the scheme in a secure communications application.

Keywords: Memristor; Chaos; LabVIEW; Secure Communication
**Urdu Language Translator Using Deep Neural Network**

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**Abstract** Urdu language of Pakistan has more than 100 million speakers in Pakistan, India, Afghanistan and Middle East. With low English literacy rate average Urdu speaking person faces barriers in communicating with foreign people in terms of accessing information, carrying business. This paper proposes an interactive Urdu to English language speech translator using deep Neural Network. ASR module in proposed pipeline is composed of deep neural network and is simpler as compared to traditional ASR which requires complex hand engineering like feature extraction and resources like phoneme dictionary. The proposed speech recognition model out performs traditional automatic speech recognition systems in efficiency, simplicity and robustness.

**Keywords:** Deep RNN, ASR, Text Blob Translation, N-gram LM, Language Translator.
Filter Design for Educational Set via LabVIEW Software Program

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Abstract Aiming this study is design for the educational digital filter set to get rid of undesirable parts of signals such as noise or extract some components. Laboratory Virtual Instrument Engineering Workbench (LabVIEW) simulation results showed that the most important point of this study is the filtering process can be simply and understood clearly on the level of the graduate students. LabVIEW software package is a widespread programming area and includes multiple functionalities from basic algebraic to sophisticated signal processing. LabVIEW has a front panel and block diagram. Initial parameters (filter degree, filter type, cutoff frequency ...) entered by users on the front panel and responses show the same panel. The most important point of this study, users can change the filter parameters while the program is running. This allows the display of the changing filter characteristic in real time output. This situation does not exist in other programs like MATLAB.

Keywords: LabVIEW Software Program, Digital FIR Filter, Educational set, simulation, Noisy signal
Improvising Security and Privacy Vulnerabilities in Smart Health;

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Abstract—Internet of Things (IoT) is defined as the development of internet with everyday objects. It is termed as a visionary transformation of objects that facilitate users and provide numerous services. IoT makes the device smarter and offers many benefits for patient monitoring by using the generated analytical data. However, adoption of these smart devices into daily life has given the birth to several security challenges and led to public security issues, including cybercrime threats, false usage of personal data and organized crimes. Breach of medical data means patient at high risk. According to a survey in 2016, total record of 554,454,942 breaches has been reported by industry from education, financial, healthcare, technology and other domains [1]. There are several security vulnerabilities and threats that are not yet discovered, well-recognized, studied or spoken in detail. The purpose of this article is to give a broad overview of the field, highlights the security, privacy vulnerabilities and complexities that have already, or are likely soon to rise. The paper is also introducing new-emerging security challenges with possible solutions and countermeasures against these threats and attacks that are not yet explained in detail with logical explanation.

Index Terms—Data Breaches, Device Security, E-Health, Internet of Things (IoTs), Smart Devices
Smart Strategies of Growth and Behavior on Smart E- Tailoring Framework with Mobile Apps Trends

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Abstract—Almost 40 percent of the world population is using the internet and half of them are from Asia. The urge of ready-made apparel has always been a charm in the industry. Since the e-commerce industry has evolved rapidly in the recent past years, online shopping has become a trend globally. Ecommerce industry has expanded enormously in the past few years. This paper investigates how online merchants can design their schemes of tailoring. A survey study of market retailers and customers has been made, the authors segregate the customers into two main categories. By examining the deep interest of the consumers they can be classified into goal oriented and pragmatic customers. The authors inspected the results regarding different approaches including the importance of mobile applications in the industry. The outcomes reveal that the differentiation based upon customization, product quantity and website design are more compelling when talking about window shoppers. Further contrast based upon support and receptiveness was found more lucrative when pragmatic customers are in the spotlight. Based on the outcomes the paper proposes a new framework to rectify/improve the tailoring strategies for the enhancement of the e-commerce industry.

Keywords—components; E-Commerce, Mobile, Virtual Clothing, Interactive design, Online Shopping, User Interface, apparel, Online Shopping, Internet, Innovativeness
Efficiency of Two Versions of SNOW against Guess & Determine Attack

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ABSTRACT: This paper is about important field of cryptography which is stream ciphers. Stream ciphers are used to certify confidentiality on a communication channel. A number of stream ciphers have been proposed during the history of cryptography. There are different types of stream ciphers e.g. RC4, Rabbit, Snow, in this thesis the type of stream cipher will be discussed is 'SNOW'. There are three version of snow snow1.0, snow2.0 and modified version of snow, efficiency parameters of snow2.0 and modified version of snow2.0 will be discussed in this paper. In this paper efficiency of two version of SNOW have been analyzed against Guess and Determine Attack.
SPECTROMETRIC ANALYSIS OF LYMPHOCYTE CELL FOR THE
PREMATURE DETECTION OF LEUKEMIA BY SURFACE PLASMONIC
TECHNIQUE IN NANOPLATFORM

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Abstract: Detection of cancer at early stages has become a top priority in the field of medical science. The existing detection methods require lot of routine tests to confirm that the sample is positive with cancer as there are chances of test results being pseudo-positive. This early stage detection of cancer will proved to be a godsend for those who are the victims of monstrous disease cancer. In this paper, we put forward a new approach for the detection of cancer at early stages by designing a 2-dimensional SPR based sensor for detailed spectral analysis of “Leukaemia” without using any biomarkers. As dielectric properties for cancer cells deviate from the normal cell, they can be identified and detected by implementing photonic approach. In the present work, simulations are done using FDTD. The shifts in the output waveforms and wavelengths have been recorded for a normal blood cell and cancerous cell respectively. It is observed from simulation that even for minute change in the RI of the bio analyte of interest and from which it is observed that there is a remarkable shift in the resonant wavelengths thus witnessing the ultra sensitivity of the design. Simulations are done using Rsoft cad tool. The peak values and wavelength shift differences for normal cells and for leukaemia, the different cell components lymphocyte, nucleus, cytoplasm and the intensity shifts are recorded in order to find the relative sensitivity of the device. The design variation were made by varying sensing layer thickness and extinction coefficient Finally comparison was made between that of normal and abnormal cells to show the wavelength shift differences so that the signature graphs for each cell were obtained in order to determine the intensity of the disease and it depends on the shift in the wavelength. The wavelength shift of early stage leukaemia for cytoplasm, nucleus and lymphocyte are ranging from 2000-250nm. Sensitivity and the quality factor of the sensor have been calculated for the proposed design, the sensitivity achieved is 343nm/RIU and the quality factor is 1800.

Key words: Optical Waveguide; Biosensors; Surface Plasmon Resonance; Refractive Index; Sensitivity, Quality factor;
Digit Recognizer using MNIST Dataset

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Abstract Handwritten Digit Recognition technique is an area of image processing, pattern recognition and feature extraction technique which are used to recognize and identify human written characters. The main objective of this paper is to let machine recognize the characters which are written by human, using some of techniques on a very basic but well-known dataset MNIST which is easily available on internet. In the proposed work, gradient features and character geometry technique have been used with the combination of artificial neural network for character recognition system. The whole process has been segmented into four parts which are: pre-processing, segmentation, feature extraction and finally classification which includes recognition. The MNIST dataset has been used for the experimental purpose. These images acted as an input to the procedure for training the system using Artificial Neural Network Technique that was further used for classification and recognition of handwritten characters. The performance of the process has been observed for the classification of the characters of English text that were written in upper cases only. But still, it requires additional examination and improvements for the segmented letters which could be obtained in order to accomplish greater accuracy rate.

Keywords: Computer Vision, Neural Networks, Image Processing, Digit Recognition, MNIST Dataset, Feature Extraction, Handwritten Character Recognition, Support Vector Machine, Gradient Feature, Feed-Forward Artificial Neural Network.
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<th><strong>High Speed OFDM based Image transmission system for Remotely Operated Underwater Vehicle (ROV)</strong></th>
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</thead>
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| Naveen H, Dr. Sreerama Reddy G M, Chetan H  
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**Abstract** The research on wireless underwater communication particularly on acoustic communication has been the core area of research in recent years. The research work focuses on design and modelling of OFDM based image transmission system for miniature remotely operated underwater vehicle (ROV). The research work focused to design and construct an underwater remotely-operated vehicle (ROV), fitted with a 4-axis positioning system, an image transmission system, and a 2-axis (pitch and roll) control system to assist imaging and positional stability. The paper includes the design and development of an ARM Cortex-M3 microcontroller based electronic circuit for the operator interface, and another ARM Cortex-M3 microcontroller based electronic circuit that controls the seven DC motors fitted with propellers. The paper includes comparative results of FFT OFDM for high speed image transmission. The ROV project ultimately represents an overlap of interests: control systems, underwater imaging system, and electronics.

**Keywords:** OFDM, Underwater Communication, ROV, Image Transmission System
Qualitative and Quantitative Analysis of Microbiology and AntiMicrobial Resistance of Gharo Water Samples (Karachi – Pakistan)

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Abstract Introduction: Gharo is a city in Thatta District, Sindh. The people of the district are deprived of basic civic facilities like drainage feature, portable water and sanitation facilities that can be a major cause of contamination in the nearby rivers, lakes and ponds that are the only source of water available domestic and industrial use in the area. Methods: 60 samples of drinking water (1 litre) were collected from various sourced in the city and were then transferred to the IIDRL-KU for analysis. Each of the samples of the sample collected was analysed by Membrane Filtration Techniques on a variety of differential and microbiological media. For the next phase all the potential pathogens were identified using conventional and rapid (QTS 10) methods and then were run through Kirby Bauer method for antibiotic susceptibility. Further Minimum Inhibitory Concentration was found using micro dilution method. Results: Almost each of the tested samples was found to be positive for the presence of potential gram-positive and negative microbes with Escherichia. Coli being the most abundant found in more than half of the samples. In the second phase potential microbes were found to quite resistant against a number of antibiotics with Doxycycline being the least effective and showing a 99% resistance. Conclusion: The analysis clearly shows that a variety of potential microbes are present in the water that can be major cause of GI diseases and the presence of E.Coli clearly indicated the contamination of water through faecal matter. Plus, high level of antibiotic resistance among potential pathogens is a matter of great concern for public health.

Keywords: Contamination, Doxycycline, Escherichia coli, Membrane filtration
Antimicrobial screening of Withania coagulans and Nigella sativa against clinical skin infection isolates

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Abstract: The research focuses on the antimicrobial activity of Withania coagulans against Nigella sativa. Withania coagulans - also commonly known, as Paneer Doda in Pakistan, is a medicinal herb that is soon facing extinction. It has been used in indigenous medicine since ancient times. It works as a therapeutic agent that is used to cure various diseases including Diabetes and Small Pox. Nigella sativa – also generally called Black cumin or Kalonji, on the other hand is used in herbal medicine as well, to treat and prevent a number of diseases including Asthma and Diarrhea. The methods that have been opted for the study are Disc Diffusion Method and Well Diffusion Method. It was observed that out of the two methods that were opted, the Well Diffusion method gave better results relative to the Disc Diffusion Method. The study of the research was fruitful in demonstrating the antimicrobial action of both Withania coagulans and Nigella sativa. It was additionally helpful in distinguishing Agar Well Diffusion Method as the more definitive method that provided more reliable results.

Keywords: Withania coagulans, Nigella sativa, Antimicrobial.
Design of Side link Protocol for D2D Communications in VANETs using LTE-A

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Abstract Increasing demands for highly efficient proximity networks led to the derivation of LTE-A (LTE-Advanced) by 3GPP (3rd Generation Partnership Project). Its superior characteristics in terms of capacity and data rates make it a user-friendly option to realize the pipe dream of efficient communication for several communication modules. Device to Device (D2D) communication is one such scheme that adopted the features of LTE-A to ensure the quality of experience and services for the users. D2D aims at establishing device connectivity by interlinking devices in the vicinity. Direct connectivity and connectivity via eNodeB (eNB) are the advisable schemes of D2D Communication. Further enhancement is D2D is realized in the form of side-link which ensures direct connectivity of devices by eliminating eNB routing. This achievement by 3GPP enhances the co-existence of side-link and D2D, which makes it adoptable in various value added services. One such value added service exists as VANETS (Vehicular ad-hoc networks), designed for inter vehicular communication to elevate quality of living of the people by ensuring public safety. This paper mainly focuses on Radio Resource Controller (RRC), Media Access Control (MAC) and ProSe layers of 3GPP protocol stack.

Keywords—D2D, LTE-A, Side-link, VANET, Proximity Services
Grating Based Pressure monitoring system for subaquatic application

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Abstract In this work we proposed fibre Bragg grating based pressure sensor, to detect the pressure in subaquatic application. For specific underwater pressure intervals, change in wavelength of FBG sensor is simulated with photonic design software. Obtained results exhibited distinct shift in peak resonant wavelength with wavelength ranging from 1550nm-1556nm with Q factor of 1, 32,280. FBG encapsulated mechanical model designed and analyzed to investigate strain behavior due to pressure application. Pressure and strain change values are overlapping for the operable wavelength of 1.5625 during mechanical and optical analysis. Absolute sensitivity of sensor found to be 0.04644 /RIU. This Proposed sensor can play significant roles in studying underwater diving conditions.

Keywords: Fiber Bragg Grating (FBG), Subaquatic, Pressure Monitor, Grating MOD, Coupling coefficient
Real-Time Crowd Analysis for Surveillance Applications in Smart City using Computer Vision

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Abstract Modern world face challenges in surveillance with growing population and limited boundaries. The complex surveillance techniques incorporate behavior analysis that predict the next move of the subject. The automated agents are programmed from numerical cutting tools to social network analysis, from surveillance to orbital predictions. Image processing in computer sciences called computer vision has achieved more like human cognition and yet to be conscious and aware of the surrounding. Proposed system is a proposed model for crowd analyses in real time. The algorithm follow simple steps such as passing an image in to a person detector, counting the number of detected person and passing it to the decision block. This approach can be useful in factories, Institutes, Corporate Buildings, inventory room and super-marts. A CCTV is available round the clock and installed as a compliance in almost all businesses. The system will get input from the CCTV, slice video into frames, count number of persons in each frame. Decide whether the condition satises that the crowd is exceeding the limit provided by the management. A simple alert is a pop-up that is shown on the system running the algorithm. Results verify such an approach in Institutes passthrough gate to be useful rather than using more expensive sensor based equipment installed at the entrances.

Keywords: CCTV, Crowd Analysis, People Counting, Template Matching.
Comparison of compressed sensing MMSE Channel estimation with conventional LS and MMSE

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Abstract The current development of wireless communication systems has impelled rise of Long Term Evolution (LTE). LTE known to be fourth generation communication technique has the ability to provide high data rate and capacity. This was conceivable due to Multiple Input Multiple Output (MIMO) Orthogonal frequency division multiplexing system (OFDM). In view of the fact that data gets corrupted, due to interference of an assortment of noise, it is required to estimate the channel to recover back the original data. This paper manages the strategy for evaluating Channel utilizing compressed sensing technique. This technique which is exploring recently guarantees improved method of recovering signal from smaller measurements. If signal can be represented has sparse, then these channels that are wireless shows response of signal that are impulse, for estimation of channel compressed sensing demodulation reference signal scheme has been proposed, From results it will be inferred that the proposed method will perform higher when compared to traditional method such as least square (LS) and minimum mean square error (MMSE).

Keywords: Channel estimation; OFDM; MIMO; LS; MMSE; Compressed sensing
Comparative Analysis between Conventional and Modified Cascaded H-Bridge
Nine Level Topologies using Multicarrier Pulse Width Modulation Techniques

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Abstract—Multilevel Inverters are used to operate sensitive devices and loads that require better power quality and lower total harmonic distortions. This research proposes a detailed comparative analysis between conventional nine level and modified nine level topology using level shifted sinusoidal pulse width modulation such as, In Phase Disposition (IPD), Phase Opposition Disposition (POD) and Alternate Phase Opposition Disposition (APOD) at different modulation index values in MATLAB/SIMULINK software. Finally, modified topology is suggested to be better choice as it uses only seven switches whereas conventional topology utilizes sixteen switches. Thus, modified topology has very less switching losses and its gate drive circuitry is less complicated as compared to conventional topology. Furthermore, the power quality is almost same in both topologies. Also it is observed from the simulated results that nine level inverter offers better power quality and lower total harmonic distortions as compared to five level and seven level topologies. Hence, filter size and filtering losses will be lower in nine level topology.

Keywords— Sinuoisoidal Pulse Width Modulation;Total Harmonic Distortion; Pow
Visualizing People's Emotions in Facebook

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Abstract: Facebook is the most common platform where people can comment, give opinions and convey their feelings by using texts that normally are embedded with emoticons. The contents of every post and comment shared by the users contain various types of issues. It becomes complicated to observe these large amounts of data manually. Hence, this paper aims to visualize the results obtained which are the people's emotions based on the texts used by Facebook users in the posts and comments. The objectives are to quantify texts in English and Malay to obtain meaningful words, visualize data based on the obtained words and evaluate the results. Two methods are applied via a combination of both point-based and region-based visualization techniques; and pixel-oriented technique. Two case studies are performed on mobile phones Facebook pages (Nokia, Samsung and Sony) and Universiti Teknologi MARA (UiTM) bursary Facebook page. The first case study uses Murvis tool which produce 2D and 3D views involving the point-based and region-based visualization techniques, whereas the pixel-oriented visualization technique is applied for the second case study. Murvis is an improvised tool that allows user to view analyzed results in both 2D and 3D views which gives an advantage to view the results from different perspectives. The pixel-based approach is helpful to view the opinion of each user by each sentences used by them. The findings obtained from the first case study is that Nokia phones has the most issues being mentioned compared to the other two phones based on point-based technique. This method gives an overall view of all three mobile phones issues whereas from the region-based method, each mobile phone has their own feature issues. The result has shown that Samsung battery feature has been mentioned the most compared to its other features. This is beneficial for the businessmen to analyze the issues faced by their customers regarding their products. Thus, they can improve their product and services from the findings. The second case study shows that most of the users are not quite happy with certain issues from the UiTM bursary page. The administrator should focus more on those users' sentence containing red-coloured pixels as it represents unhappy words. More combination of techniques can be used to visualize data for future work. Keywords: Visualization, Social Network, Quantifying sentiments, Facebook, Emotion analysis.
Secure Identity-Based Cryptographic approach for Vehicular Ad-hoc Networks

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Abstract: Now a day’s year number of vehicles on the road has increased in recent years. “Potential threats and road accidents are increasing because to the high density of all these vehicles. In order to reduce these factors Wireless technology is designed to equip in-vehicle technology by sending messages to each other, known as vehicular ad hoc networks or VANET. The optimal goal of this research is to provide timely information to drivers and concerned authorities so that vehicular networks will contribute to safer and more efficient roads in the future. Thus to achieve the above mentioned goal, there is need for substantial research in the area of security for the possible deployment of VANET in near future. In terms of architecture, implementation of Identity Based Cryptography (IBC) schemes has been studied in order to provide better security and privacy for VANET, as it is considered as a viable choice due to the properties of VANET in comparison to the traditional Public Key Infrastructure (PKI) approach”.

Keywords: Encryption, decryption, cryptography, updated data (UPD), encrypted data (ENCD), final encrypted data (ENCDF), circular-left shift, circular-right shift, plain text, cipher text, key (KY).

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Abstract This research focuses to perform deep analysis on the security challenges, reliability and performance emerged from SDN. Based on this analysis, suggested solution that is more suitable as compared to the existing systems in practice. This research reviews the areas that are prone to threats and demanding security measures, reliability and performance at the same time while keeping maximum functional transparency of SDN.

Keywords – SDN, Security, Network Management, Computer Network
Biclustering using Intelligent Water Drops Algorithm with Leader Clustering

Approach for Web Usage Mining

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Abstract Web Usage Mining is the application of data mining techniques to ascertain uncovered usage patterns from Web data in order to understand and better serve the needs of Web-based applications. Usage data captures the browsing behavior of web users at a Web site. Usage mining allows companies to produce productive information pertaining to the future of their business function ability. Merely grouping the users based on their browsing behavior is not a sufficient one. In recent years, there have been various efforts to overcome the limitations of standard clustering approaches. Recently, biclustering techniques were proposed for revealing submatrices showing unique patterns. It automatically captures the hidden browsing patterns from it in the form of biclusters. In this study, a swarm based Intelligent Water Drops algorithm is used to capture the optimal bicluster. Also, Leader clustering algorithm is used to develop initial bicluster so that the quality of the end clusters are improved. Experimental studies made it evident that the proposed approach finds bicluser in an efficient manner.

Keywords: Biclustering, Intelligent Water Drops, Web Usage Mining, Leader Algorithm.
Minimizing Exploration Time Using Cluster Heads Tree in Multirobot Area Exploration

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ABSTRACT Multirobot systems are required to perform quicker in various areas of robotics ranging from localization to mapping and exploration. Cluster formation and creating Cluster head is performed in order to reduce exploration time in Multirobot area exploration. In particular, it is not known how to choose the best candidates for the cluster head roles. Proposed method is creating Cluster Head from an already created Tree that goes for decreasing the investigation time and to limit the overall traverse distance of the robots by planning the cluster heads. Cluster Heads(CHs) are selected from set of nodes. Applications of Clustering includes habitat monitoring, area monitoring, water quality monitor, landslide detection, disaster detection. The simulations will be performed on Matlab.

Keywords: Exploration, Multi-Robot, Cluster Heads, Exploration Time, Random nodes
Elliptic Curve Cryptography Using Chaotic Neural Network

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Abstract—Cryptography is the science of hiding important information while transmitting over an insecure channel making it impossible for any adversary to read. Cryptography is very important for transmission and sharing of confidential information preventing any misuse of it. Neural Networks is a mathematical model which simulates the structure and functionality of biological neural network. A chaotic neural network is a network which adds randomness to a signal which is extremely hard to predict. Adding a Chaotic Neural Network to a Cryptographic system enhances the security of the system making it difficult to decode by the adversaries. In this research paper we have collaborated a Chaotic Neural Network with an Elliptic Curve Cryptographic System which is then compared with the conventional models such as RSA, Blowfish and RC2 models and is found to be better than various models based on certain parameters.

New Approach Based Internet of Things for a Clean Atmosphere

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Abstract—We are hearing more and more about the Internet of Things, connected objects, even the connected world, and smart homes; new concepts that invade the world and disrupt our way of life. The Internet of Things called the 3rd industrial revolution will profoundly change the people lives with home automation, health and recreation, energy, distribution and our environment with smart city or connected transport. The information collection remains a major challenge that without the participation of several partners cannot be easy. This participation manifests the Crowdsourcing. In this communication, we will discuss the technology of the Internet of Things (IoT) and connected objects and their importance in our daily lives. Then we will present our project "Crowdsourcing based on Connected Objects for the measurement of pollution".

Keywords—Connected Objects, Internet of Objects, Cloud Computing, IoT
A Survey on Sentiment Analysis, Classification and Applications

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Abstract Study conducted to evaluate the everyday behaviors, views, considerations, persuasive approaches, sentiments and reactions of society in accordance to the happenings around them. Sentiment analysis plays a vital role in the research area of text mining. The aim behind the sentiment classification is to analyze the core (subjective) information in the text and then categorizes into one of the three categories positive, negative and neutral. The purpose of this paper is to analyze different techniques for sentiment classification that assign a polarity to an opinionated text. This paper summarized the sentiment levels for classification, some widely used algorithms, possible challenges and application areas of sentiment classification.

Keywords: Sentiment Analysis, Social Media, Blogs, Forum, Polarity
Usability Evaluation Method through SUS Analysis for Coin Party

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Abstract Usability explains the procedure about how a product or system is providing interaction to the user. Usability is about effectiveness, efficiency and the overall satisfaction of the user. The performance and satisfaction metrics are the base line for developing of Usability tasks. This paper outlines the usability factors that effect User satisfaction while using an android application “Coin Party”. System Usability Scale (SUS) model [6] is used to evaluate the dimensions of usability. A sample size of twenty five users based on convenience sampling were surveyed. The result suggest that the game has a high Enjoyability level, and also there is a high rate of task success, it is relatively easier to move up levels, but there is a high chance of player not knowing the exact level is he at and level up is also not highlighted in the game. The game has a sluggish GUI with a low learnability.

Smart Grid Security with AES Hardware Chip

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Abstract Smart grid is the upgradation of the existing grid in terms of cost, communication infrastructure, IOT and reliable technologies. In ambitious flagship programme of digital India- project an initiative of India, the potential fields of the missions are identified in the area are smart energy, smart grids, smart homes and smart cities. More than 100 smart cities are planned for ICT driven solutions with big data analytics in India. The exponential growth in smart grids has given certain security risks, cyber threats and protection of stored data as Nation security. Smart Grids, comprising of several communication, monitoring intelligent, metering and electrical equipment used in power grid, have a greater exposure to grid security and cyberattacks which are potentially disrupt distribution in a city. The paper discusses the electrical grid, challenges in smart grid and the use of AES algorithm enable with FPGA hardware in smart grids. The AES encryption and decryption chip is designed in Xilinx ISE 14.2 software, synthesized on SPARTAN-3E FPGA and verified with some test cases to ensure that AES can be employed in smart grid security and communication infrastructure.

Keywords: Smart grid communication, Security, FPGA synthesis, AES algorithm
A Context-aware Data Fusion Approach for Health-IoT

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Abstract The technological advances in low-cost sensor devices and communication technologies bring rapid increase in development of smart homes and smart environments. The developments in wireless sensor networks (WSN), body sensor networks (BSN), cloud computing and big data technologies trigger the use of Internet of Things (IoT) in healthcare industry. This poses many challenges such as heterogeneous data fusion, context-awareness, complex query processing, reliability and accuracy etc. Data fusion techniques are used to extract meaningful information from heterogeneous IoT data. It combines individual data from sensor sources to collectively obtain a result, which is more reliable, accurate and complete. Apart from wearable sensors, additional context sensors need to be added to build a context. Health IoT applications has potential benefits of using context-aware data fusion. By using context information, the behavior of the application can be customized according to the specific situation. This paper provides a brief concept of context-aware data fusion and includes data management approach for context-aware systems for healthcare applications. Finally, a context-aware data fusion approach for health IoT is proposed. It includes context acquisition, situation building and reasoning & inference.

Keywords: Data fusion, Context-awareness, Healthcare, Internet of Things
Experimental Evaluation of Bridge Structural Health Monitoring Using Finite Element Method

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Abstract: The bridges are subjected to unpredictable loads like: accidents, earthquakes and floods etc during their service life. That not only affects its service life but also causes structural failure. Failure of the bridges is the biggest threat to human life as well as the assets. To avoid the structural failure, Transient Structural Health Monitoring (SHM) of bridges could be carried out during its service life, in order to meet the service, safety and reliability requirements. This research work has a novelty of conducting transient structural analysis (SHM) using Finite Element Method (FEM) of intact as well as damaged test bridge that are having the same physical parameters to analyze behavior change of the damage in the test bridge, when some loading conditions are applied using FEM. The authenticity of this analysis can be clearly shown, when the transient structural parameters are compared between the two test bridges. Variations in the parameters like equivalent stresses, principle stresses, deformation and maximum equivalent strain are analyzed for the structural condition monitoring of the test bridges. These two test bridges, represents the actual bridges that are being used in day to day lives. The results obtained may lead to develop intelligent instrumentation for bridge health monitoring.

Keywords: transient structural analysis, structural failure, intact and damaged test bridge, simulation and modeling, Intelligent instrumentation
INVITRO STUDIES OF MORINGA OLEIFERA

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Abstract: Moringa oleifera, known as the miracle tree, is a plant of great importance. The plant is well known for its diverse medicinal and nutritional properties. The objective of the research is focused on tissue culture of Moringa oleifera through callus induction, direct multiplication as well as from seed culture. The study is also focused on optimization of sterilization protocol and media for the tissue culture processes. As expected, Moringa oleifera gave promising results using MS Media supplemented with different concentrations of Plant Growth Regulators such as IAA, NAA, BAP, Kinetin and 2,4-D. Seed initiation gave optimum results on MS Basal media. Direct multiplication of the plant was observed with optimum results on MS media supplemented with 0.1mg/L BAP. For callus induction, effects of Plant Growth Regulator and photoperiod were observed. In Dark conditions, maximum growth was seen on MS media supplemented with 2, 4-D (2mg/L), and that in light conditions, MS media with 2,4-D (2mg/L and 3mg/L) gave almost similar results. Initially, seed coats were removed inside the Laminar Flow Hood but this was affecting the sterilization negatively. Seed sterilization was then modified by removing seed coats and sterilizing them outside the Laminar Flow Hood. The seeds were then transferred to the LFH for further sterilization, and then cultured on the growth media. For the sterilization of the explant for direct multiplication and callus induction, firstly Ethanol was used which caused bleaching effect. Later, Ethanol was removed from the protocol, reducing the bleaching effect to zero, and sterilization was maximized.
CHANNEL CAPACITY ANALYSIS OF DECODE-FORWARD 
BASED CO-
OPERATIVE COMMUNICATION SYSTEM OVER $\alpha$-$\mu$ FADING 
CHANNEL

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Abstract: In this paper, the analytical channel capacity of the decode-and-forward (DF) based dual-hop radio frequency (RF) and free space optical (FSO) system is studied. Where the first link from source (S) to relay (R) is considered as multipath RF fading channel and the channel characteristics are modelled as Rayleigh distributed. The second link (from R to destination (D)) is assumed as FSO link which has been modelled as $\alpha$-$\mu$ distributed. It is further considered that there is no direct link between S and D. For the proposed RF/FSO cooperative communication system, a mathematical expressions for average channel capacity is derived, under the influence of multipath fading and atmospheric turbulence. Finally, using derived expressions, the effect of channel conditions, on the ergodic channel capacity (EC) of RF/FSO cooperative system, is analyzed.

Keywords: Cooperative communication, decode-and-forward, FSO, ergodic channel capacity
Comparison of Performance Metrics In Routing Protocols for Underwater Sensor Networks

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Abstract There is a great demand of an Underwater Sensor Networks (UWSNs) in applications of water monitoring and offshore exploration. In such applications, network comprises of multiple sensor nodes which are deployed at different locations and depths of water. Sensor nodes perform collective tasks such as data collection and data transmission to other nodes or Base Station (BS). The bottom nodes are located at depth of water, and are not able to communicate directly with the surface level nodes, these nodes require multi-hop communication with appropriate routing protocol. Therefore an energy efficient routing protocols are used for such scenarios, which is necessary as well as challenging task. As sensors are battery operated devices, which are really problematic to recharge or replace. The error and propagation path delays are high in acoustic channels therefore underwater communication is much effected. Realizing the circumstances, more attention has been given to compare energy efficient routing protocols which comparatively consume low energy and achieve high throughput. This paper, comprises of analysis and comparison of existing UWSN based efficient energy routing protocols. Based upon the analysis and comparison, VBF and DBR have been proposed that fulfill the requirements. The analysis is done on NS-2 and for comparison, the performance metrics which are evaluated are: Packet delivery Ratio (PDR), energy consumption, throughput and average End to End (E2E) delay.

The results shows that VBF protocol consume very large amount of energy as compared to DBR protocol. Whereas DBR protocol have characteristics like low energy consumption, minimum delay high PDR and high throughput than VBF protocol.

Keywords: Energy efficient; Routing, VBF; DBR, Underwater sensor networks;
PROPOSED EFFICIENT METHOD FOR TICKET BOOKING (PEMTB)

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Abstract — The purpose of this study is to explore the different platform that influence the client to become social. Our project (GOtickets) is basically a more easy way to book ticket for all categories of events includes the movie, festivals, holiday tour, events, sports and much more. This project is based on Cloud computing and we implement the digitalized concept of ticket marketing in which person can buy tickets in digital form and use single platform for all types of events booking. We used angular JS, ionic for a front end and node.js, express.js for a back end and mongo DB for a database. Our application works on both OS platform (IOS and android). The project has been successfully in the developing process and the system performance is found satisfactory. The use of computers in non-productive tasks helps users to reduce wasted time. User-friendly menu-driven interface users can then use the services of the app via a registration form can register themselves. this paper deals with the development and implementation of smart phone which is more effective and simple and we also introduce QR scanning bar code reader that contain information about ticket in the form of bar. Moreover, the authentication of the ticket is checking by another person through QR scanning bar code reader which verifies, QRcode information with the database and reduces the burden of event manager.

Keywords — Ios , Android, Cloud-database, QR scanning barcode reader.
### Hybrid Test Automation Framework for managing Test Data

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**Abstract** Test Data is an essential element for both, Manual and Automation Software Testing and more so in Automation Testing where data drives the test execution. Test Data Management (TDM) is an important ingredient for testing however test automation has been proven to successfully test the data intensive applications. Hence, we would primarily focus TDM for Test Automation in this research. The purpose of TDM is to improve the effectiveness and reduce the time and cost of testing. However, it is essential to identify the components of TDM that contribute towards fulfilling the purpose. Test Data Management involves systematic approach in creating and managing test data (test scenarios, test cases and test data being used). In order to succeed, it requires strategy and a tool to enable teams to create and manage test data in effective and efficient ways. Many hybrid frameworks and tools have been deployed that permit data driven scripts to carry out keyword driven testing. However, it is identified that most of them have lacked correctness and coverage of components of TDM. In this paper, we introduce test automation framework called TAFPro that works as a test harness for IBM test automation tools and offers increase in efficiency and reduction in application and life cycle costs. Since organizations are moving towards open source tools we aim to make the TAFPro tool independent for Java based test tools and ran a CASE study with Selenium successfully for TDM and achieved the goal.

**Keywords:** Hybrid Automation Framework; Test Data Management, Hybrid framework for Selenium, Test Automation
The Software Engineering Body of Knowledge: A Benchmarking Tool for Organizational Process Assessment and Improvement – Case Study

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Abstract The Guide to the Software Engineering Body of Knowledge (the SWEBOK Guide) represents the consensus on the knowledge that software engineers, and their organizations, should use whenever and wherever appropriate in software development. This paper presents an innovative use of this SWEBOK Guide as a benchmarking reference for software organizations interested in process improvement and looking for best practices. Process improvement approaches help organizations improve their processes and their performance. Before implementing improvements to existing processes, it is necessary to benchmark organization’s practices already in place against a reference, identifying process weaknesses and looking for best practices that can contribute to process improvement according to corporate priorities. This paper presents two industry case studies illustrating the use of the SWEBOK Guide for benchmarking purposes and process improvements. This paper presents also quantitative results of productivity and quality analyses in both organizations and discusses the candidate linkages.

Keywords: Appraisal, Best practices, SWEBOK, Process improvement.
Performance analysis over asymmetric Rayleigh and k-μ fading channel for dual hop decode-forward relaying

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Abstract: In this paper, we have studied the performance of decode and forward based cooperative communication system over asymmetric fading channel. Rayleigh distribution has been taken for channel between source S and relay R and k-μ distribution has been considered between relay R and destination D. More specifically, we have derived the expression of outage probability for the system under consideration. Derived expression of outage probability is further utilized for the development of expression of bit error rate (BER) for the BPSK modulation scheme. We have also analyzed the effect of various system parameters on the outage probability and BER in the latter part of manuscript.

Keywords: Decode-forward, k-μ fading, bit error rate (BER), Rayleigh fading, outage probability
Electrical Equipment Incipient Faults Simulation using Electromagnetic Field Emission

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Abstract Predicting failures of electrical equipment is an increasingly important topic in wide range of settings including industry as well as household appliances. The protection from failures can be achieved through early preventive actions while faults are in early stages. Identification of such incipient faults needs a thorough study and understanding of their patterns. Several methods exist for collecting necessary incipient fault data for further analysis and extraction of those patterns. One approach is to use the Electromagnetic Fields (EMF) emission from electrical equipment as a signature of incipient fault. However, this parameter requires conducting measurements to capture the EMF emission from equipment experiencing one or more incipient faults, which might require interrupting or damaging the equipment or parts of it, potentially leading to hazardous consequences. Another method is to design an antenna that generates faulty signals like those of equipment experiencing real incipient faults. However, this method requires detailed knowledge about the faults and the EMF emission propagation mechanism and is not in favor due to cost and design complexity. Hence, in this paper, we propose to simulate incipient faults based on a derived model of the EMF emission of a normal operating equipment. To generate the simulated signals, the coefficients of the model transfer function are systematically varied to yield different incipient fault patterns. The results are validated with two measured incipient faults, namely, inverter and winding faults and it was found that the correlation between the simulated and actual faults was significant which indicates that this method is viable as another source of data for incipient fault analysis.

Keywords Fault, EMF Emissions, EMF Source Modeling, Electrical Equipment, Identification
Integrated optical delay line based on Mach–Zehnder Interferometer

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Abstract An integrated optical delay line is presented and experimentally demonstrated with a true-time delay continuously tuned up to 125 ps. The proposed device is based on a Mach–Zehnder interferometer with tuneable couplers, can be ideally operated with a single control signal, and achieves a bandwidth-delay product consistently larger than ring-based delay lines.

Keywords: Optical delay lines, true-time delay, microwave photonics, optical filters, Mach-Zehnder interferometer, integrated photonics, indium phosphide waveguides.
A Framework for Visual Representation of Crime Information

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Abstract—The growing number of crimes is always the prime concern of security agencies responsible for maintaining law and order situation. Crime analysis is the activity of aggregating all the crime reports to generate a single comprehensive report of all crimes, which helps in decision-making and controlling crimes. This paper proposes a framework that transforms the structural crime related data into effective visual reports to strengthen the pro-active activities of law enforcement agencies. Especially, it performs comprehensive processing of crime information to detecting heat-maps of crimes, clustering crime patterns and presenting it by means of information visualization techniques. In particular, the visual information is presented in three different formats: 1) statistically summarized reports in graphical formats, 2) heat-maps of crimes and 3) clusters of crime patterns based on geo-locations. The proposed framework may help in assisting security officials to cope with crime rates within certain geo-location. The visual crime analysis information may also help the policy-makers to gain depth knowledge about crime types, their timings at certain regions. This insight knowledge may improve the performance of law enforcement agencies in reducing crime rate and utilizing resources efficiently.

Keywords—data visualization, information visualization, heat maps, crime information;
**WEEP: Weight Based Energy Efficient Priority Scheduling of Data Packets in Mobile Ad-hoc Networks**

**Abstract**— A mobile ad hoc network is an infrastructure less network where topology is very dynamic and nodes are energy constrained. Therefore, energy efficient scheduling of data packets is need of the hour. In most cases, an external priority is assigned to data packets which we have to take care. Along with that, in WEEP, we consider residual lifetime of source and destination nodes to estimate whether the current packet can be sent to destination. Moreover, if possibility of completion of a communication session is less, then more weight is given to data packets belonging to those sessions. The main intention here is to reduce the number of route request messages, as much as possible, through the scheduling policy. Therefore, high priorities are given to those packets which are travelling along fragile paths compared to those traveling along the stable paths. Simulation results show that performance improvement produced by WEEP is very significant compared to other state-of-the-art scheduling protocols. To the best of author’s knowledge, this is the first scheduling algorithm in ad hoc network that considers expected residual lifetime of destination along with performance and fragility of a path.

**Index Terms**— Ad hoc Networks, data packet, Energy Efficiency, Priority, Routerequest, Scheduling, Weight.
Performance Comparison between Various Configurations of PID Controller for Nonlinear Inverted Pendulum System

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Abstract The nonlinear inverted pendulum system is a source of interest for control engineers and robotics researchers. The objective is to determine a combination of PID controllers for inverted pendulum system that delivers better performance results vis-a-vis control of pendulum angle and cart’s position. Being inherently unstable dynamic structure, the system poses a considerable challenge. Three different arrangements of PID controller have been designed and implemented to control angular and translational responses. MATLAB SIMULINK has been used to analyses system response in various configurations. Simulation results explicitly justify the better performance of PID-PID controller combination.

Keywords: Inverted pendulum, Nonlinear system, PID control.
Modeling and Simulation for DC Motor Using Classical Control and Pole Placement Control Design

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Abstract—This paper elucidates various techniques to control the speed of DC motor and also studied about PID and the state space controller and modeling of DC motor. DC motor is extensively used in industries due to its ease of controllability. The PID and state space controller are designed and implemented in MATLAB Simulink for control of DC motor speed. The performance of both controllers are analyzed and compared in the time domain using step response through MATLAB simulation. The pole placement gives satisfactory response than the PID controller.

Key words—DC motor, The PID controller, State space controller
Investigation of Optimum Temperature Regulating Technique for Shell and Tube Type Heat Exchanger

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Abstract Heat exchanger is used for transfer of heat from one form of matter to another form. Matter is mostly liquid, air, oil and steam. Heat exchangers are frequently used in chemical plants, oil refineries and process industry as they involves working of product at different temperature. For getting maximum out of product whether it is heating or cooling, regular monitoring and controlling of product is necessary which can be achieved by proper modelling of heat exchanger. In this paper, mathematical modeling of shell-tube type heat exchanger components will be developed and then it will simulated on Simulink by using feedback control, feed forward with feedback and internal model controller. These three models will be processed for mathematical model and simulation by using experimental data from reference paper. Furthermore, performance of three models will be evaluated depending upon their response parameters like overshoot, rise time, settling time, and stability.

Keywords: PID controller; Feedback; Feed-forward; Internal model controller (IMC); Shell-Tube heat exchanger.
Analytical Study of Existing XG-PON and Proposed NG-PON Networks with DQPSK Downstream and IRZ Upstream Modulation Techniques

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Abstract In last few years, evolution in passive optical networks (PON) has been increased due to increase in requirement of high bandwidth demanded from customers. In this paper, XG-PON, NG-PON1 and NGPON2 are analyzed by employing DQPSK and IRZ modulation techniques for downstream and upstream transmission respectively. The performance of the system has been evaluated on the basis of bit error rate (BER) relating to received power and transmission distance. The results show that receiver sensitivity of NG-PON 2 is -3 to -5dBm shorter than other PON’s in downstream transmission and -2dBm to -3dBm less for upstream transmission while achieving 40 Gbps transmission rate over the distance of 10km fiber optic channel.

Keywords: Fiber to the home (FTTH), 10Gbps Passive Optical Network (XG-PON), Next Generation Passive Optical Network (NG-PON), Differential Quadrature Phase Shift Keying (DQPSK), Inverse Return to zero (IRZ)
History of Nanotechnology: Past, Current and Future Applications in Drug Delivery and Imaging

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Abstract This article surveys the utilizations of nanotechnology in the fields of life sciences and medical. Different types of devices derived from chemistry, physics, biology and engineering covered by this multidisciplinary field. New opportunities in medicine and ailment therapy in human opened up by flourished field of nanotechnology. The purpose of devices to interact with body at sub cellular level with great target specificity achieved by this phenomenon with minimal side effects. Recent development in nanotechnology also provides tools for different disease treatment and imaging. Nanotechnology plays key role in drug therapy and pathology diagnosis successfully.

Keywords: Nanotechnology, medical imaging, nanoparticles, drug delivery, clinical diagnosis
Link Duration Analysis of Entity Mobility Models in the Network of Moving Objects

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Abstract—In this research article, the Probability Density Function of Link Duration has been analyzed by using three mobility models in the networks of moving objects. Link duration is a derived metric of graph theory. For the analysis two well-known along with a proposed mobility model has been selected. Several performance criterion have been considered for the analysis including speed of node, Transmission range, node density, simulation area and computational complexity in terms of time. The robustness, reliability of the proposed schemes has been examined by using Monte Carlo simulations and their statistical analysis. The real advantage of the proposed scheme is to study the entity based mobility of objects which do not show much variance of angle and direction in their movement style(like vehicles on highway).this model provide ease of implementation due to simplicity of the code and concept in entity mobility models.

Index Terms—Ad-hoc Networks; Connectivity; Link Duration; Mobility Models; Monte Carlo Simulations.
| 384 | **PI, Fuzzy and ANFIS based Performance Analysis on the Hybrid Shunt Active Filter Controlled by a Composite Control Technique** |

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**Abstract**-This paper demonstrates the hybrid active power filter (HAPF) implementation in the two-bus system with non-linear loads comprising of inductance, capacitance and the rectifier using intelligent controllers. Active Power filter (APF) is developed using the point of common coupling (PCC) voltage regulation principle based composite controller. Matlab based implementation using PI, Fuzzy and Adaptive Neuro Fuzzy Inference System (ANFIS) controllers is carried out and the results are tabulated and observed. It is perceived that the Neuro Fuzzy implementation of the HAPF is achieving better results. A two-bus system with all the three types of loads like rectifier with resistance, inductance and capacitance is considered for the analysis. This paper uses the composite control technique. The correction in power factor, Total Harmonic Distortion (THD) improvement and reactive power compensation are used as the measure of the performance in the performance analysis carried out in this paper.  

**Keywords**: PI Controller, Fuzzy Controller, ANFIS Controller, Active Power Filter, Hybrid Active Power Filter, Power Factor Correction and THD
Analysis of DTN Routing Protocols in DRHT and TSP

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Abstract: We propose in this work a topology adapted to the routing in the delay tolerant networks (DTN). This topology plays a very important role in the design and the implementation of routing protocols in this type of networks devoid of any infrastructure and any centralized administration with an intermittent connectivity. Indeed, we develop a DTN routing hierarchical topology (DRHT) which incorporates three fundamental concepts: ferries messages, ferries routes and clusters. The intracluster routing is managed by the cluster head, while the inter-cluster routing is managed by the ferries messages. This approach allows us to improve the performances of DTN networks. The simulations results have shown that our solution the DRHT proves to be effective and adequate in the context of the DTN networks compared to other existing approaches.

Keywords: Delay Tolerant Networks (DTN); DRHT; TSP; Message Ferry; Hierarchy Routing
**Capacity and BER Analysis of FSO Link in Adverse Weather Conditions over K-Distribution**

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**Abstract:** In a free-space optical (FSO) link, the propagating optical signal is deteriorated by turbulence induced fading in the atmosphere and attenuation due to adverse weather conditions. The performance of the link is also degraded due to pointing error resulting from the misalignment of laser at the transmitter and photodetector at the receiver. In this paper, closed form analytical expressions to evaluate average capacity and BER in turbulence alongwith pointing error and path loss due to adverse weather are given. The turbulence in the atmosphere is assumed to be modelled by k-distribution. This analysis reveals that performance of a FSO link is degraded in adverse weather conditions and the most severe degradation in the performance is observed in foggy conditions.

**Keywords:** Turbulence, k-distribution, free space optics, pointing error, bit-error rate, capacity, path los.
Smart Grid - Security and Hardware Cryptography Using TACIT Algorithm Adesh Kumar

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Abstract—The smart grid is the upgradation in the existing grids in terms of performance, cost, reliable technologies, IOT and communication infrastructure, considered as next generation power systems and evolutionary regime of conventional grids. The paper focuses on the need of smart grid over traditional smart grid, security issues and proposed solution as cryptography encryption and decryption techniques in consumer side. The technology adopted by the traditional grids is outdated and in many cases not reliable, costing unnecessary money to the utilities, and consumers. The smart grid provides the two ways communication which enables consumers to save energy and advanced metering technologies provides such environment that permits to sell back energy into the grid. To upgrade the conventional grid, it is essentially required to update the system with distributed sub systems, intelligence and broadband communication network. In the network communication, network security is an issue to prevent the smart grid from attackers. Moreover, smart grid must be configured in such a way that the energy usage should be less, while dealing with energy delivery networks and energy management. The paper provides a solution which can be integrated with smart grid devices because smart grid has electronics devices and real time data base access. TACIT Cryptographic encryption and decryption algorithms are proposed to integrate with the smart grid electronics devices, embedded as Field Programmable Gate Array (FPGA) chips for higher throughput and proven extremely secured network. The algorithm is developed using VHDL programming language and targeted on Virtex-5 FPGA to ensure that the algorithm can be applicable in smart grids and provides the new platform for grid security.

Keywords—Smart Grid, Network Security, Field Programmable Gate Array (FPGA), Cryptography
Light-weight and Low-cost HealthCare - A Cloud based BAN for Remote Health Monitoring

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Abstract—A BAN, which fundamentally comprises of remote wearable sensor nodes typically organized by means of a sta-tionary or portable device, is principally adopted to examine single aided livings. A system of BANs worn by a group of individuals for continuous monitoring delivers huge sum of contextual information that require an adaptable, scalable and cost effective approach for storage capacity as well as elaboration. In this paper, we propose a cloud-integrated light-weight and low-costs health care wireless BAN. Our proposed system is intended to evaluate and observe significant physiological information of a patient with a specific end goal to precisely portray the status of her/his wellbeing and wellness anytime anywhere. To ensure accuracy and reliability the proposed BAN has been field tested. The test outcomes demonstrate that it is able to calculate the patient’s physiological vitals with a very high accuracy.

Index Terms—Wireless Body Area Network, Cloud Compu-t-ing, Smart Health Care, Remote Patient monitoring system
Anomaly detection of streaming data using big data analytics

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Abstract: The streaming data is produced continuously by millions of devices in enormous amount at high speed. The most of the work is done on data which is generated offline or in batch format but work related to online or streaming data is still an open issue for researchers. The streaming data ascends new problems in the field of data streaming because of its production at fast rate. The applications performing the anomaly detection especially on the streaming data are dealing with different issues because of the dynamic change in its size and structure. For detection of anomalies in a stream of data, we have picked Streaming or Online KMeans algorithm. To implement this algorithm, we apply an architecture of big data ecosystem including Apache Kafka and Spark Streaming processing. The algorithm is analyzed based on standalone, YARN, and Mesos modes. The analyses mainly investigates two factors; the processing time and accuracy of algorithm. To improve the processing time, we have proposed and implemented the distributed or parallel architecture. In the result, we observed proposed architecture is taking less time as compared to the single standalone mode. Furthermore, we have also investigated the accuracy of the Streaming KMeans using three aforementioned modes.

Keywords—Big data; Streaming data; Anomaly detection; Machine Learning; Stream Clustering
Welcome to the 4th International Conference on Green Computing and Engineering Technology (ICGCET®) 2018. The conference will be held on 17 Aug - 19 Aug 2018 in Aalborg University, Niels Bohrs Vej 8, Esbjerg, Denmark. The main objective of ICGCET®-2018 is to present the research from different areas of science and technology. This conference provides a platform for researchers and scientists across the world to exchange and share their experiences and research results about all aspects of electronics and information technology. This conference also provides an opportunity to interact and establish professional relations for future collaboration. The conference aims to promote innovations and work of researchers, engineers, students and scientists from across the world on Advancement in electronic and computer systems. The basic idea of the conference is what more can be done using the existing technology. In Today's world electronic and computer systems plays an important role for future's innovation. These systems involve a very wide area for research. This ICGCET® conference is a sister conference of RTCSE® conference and ICEES conference. Gyancity Research Lab organize 3 conferences in 3 continents: ICGCET® in Europe, RTCSE® in Asia and ICOSAT in North America. ICGCET® was organized in Dubai, Denmark in 2015 and 2016 respectively, RTCSE conference was in Malaysia in 2016 and 2017. ICEES will organize in Canada in 2018.

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© Gyancity International Publishers
ISBN- 978-81-938900-7-3
Gyancity Research Lab Pvt Ltd
www.gyancity.com
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