Proceeding of the 2nd International Multi-Topic Conference on Engineering and Science

Jason Levy, G. S. Tomar, Bishwajeet Pandey

Organized By
Gyancity Research Lab, Gyancity Educational Trust,
Gyancity Research Consultancy Pvt Ltd, and
University of Hawaii, USA

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Chair Message ……

As a chair I have the honor to welcome you with great respect and enthusiasm to the 2nd International Multi-Topic Conference on Engineering and Science (IMCES’19) to be held at Holiday Inn Mauritius Mon Tresor, Mon Tresor, Plaine Magnien, Mauritius on 05-07 May 2019. It is the 9th 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. IMCES’19 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 end of 2019.

As a chair and on behalf of the organizing committee I sincerely hope that IMCES’19 will offer a great venue at Hawaii 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 IMCES’19 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 Hawaii, USA.

Best wishes.

PROF. JASON LEVY, Ph.D.
Conference Chair
Professor of Disaster Preparedness and Emergency Management, University of Hawaii, USA
Tel: (808) 689-2492
Email: jlevy@hawaii.edu
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Scientific Applications of Forensic Science for Detection of Criminals & different Diseases Using Optical Biosensor

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| 10:00-12:00 | University of Mauritius visit  
Under Guidance of  
Prof Ponnadurai Ramasami, University of Mauritius,  
ramchemi@intnet.mu  |
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• Rajinder Tiwari, Model Institute of Engineering and Technology, Jammu, India
Johnson, O. V., Research and Development Centre, Bharathiar University, Coimbatore, Tamilnadu, India
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Naresh Sharma, Delhi University, Delhi, India
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Prabhat Ranjan Singh, Wuhan University of Technology, China
Ahmed Al Marouf, Daffodil International University, Bangladesh
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Mohsin Jamil, National University of Sciences and Technology (NUST), Islamabad Pakistan.
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Salman Yussof, Universiti Tenaga Nasional, Malaysia
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Lakshmisridevi Subbaraman, Hindustan Institute of Technology and Science, India
Amanpreet Sandhu, Chitkara University, India
Pramod Kumar Singh, Indian Institute of Information Technology and Management, Gwalior, India.
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Atiqur Rahman, South Asian University, Bangladesh.
Mumtaz Hussain Soomro, Universita’ Degli Studi Roma Tre, Rome, Italy
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Lubna Luxmi Dhirani, University of Limerick, Limerick, Ireland.
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Rupesh Gupta, Chitkara University, Rajpura, India
Zain Anwar Ali, Sir Syed University of Engineering & Technology, Pakistan
Suhail Soomro, Mehran University of Engineering and Technology, Pakistan
- Jahangeer Soomro, Sukkur IBA University, Pakistan
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- Fozia Khan, Sir Syed University of Engineering and Technology, Pakistan
- Faycal Bensalah, STIC Laboratory, Chouaib Doukkali University, Faculty of Sciences, Morocco
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- Vinaye Armoogum, University of Technology Mauritius
- Dipti Mishra, IIIT Allahabad, India

Conference Convener

Abhishek Kumar, Gyancity Research Lab, India
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<th>Paper ID</th>
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<td>05</td>
<td><strong>Increasing the Efficiency of Smart Patient Room Using Internet of Things (IoT)</strong></td>
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**Umme Laila, Muhammad Ibrar-Ul-Haque, Agha Yasir Ali and Chandan Lal**

Sir Syed University of Engineering and Technology, Pakistan

ulaila2002@gmail.com, mihaque@ssuet.edu.pk, aghayasirali@hotmail.com, chandanlal@hotmail.com

**Abstract**-
Researchers are developing more applications based on Internet of Things (IoT) in healthcare services. Proper health care services are the major requirements now a days due to constant increase in the population. These days a major problem faced by critical patients or victims of any kind of accident is of receiving treatment on time, which in some cases becomes a huge problem specially when hospitals refused to take patients in their ER due to unavailability of beds. Travel time consumed while moving patients from one hospital to another at times results in death. The modern technology is able to manage the needs by using IoT technologies that can connect smart objects together. This paper provides the solution to the users who want prompt and timely medical treatment for their loved ones, especially in case of emergency. Smart IoT based patient room is a system that enables paramedic staff/user to get the information about beds availability in the Emergency Room in real time. The smart patient room is different from other emergency rooms by allowing the user to see the status of bed inside the emergency room from anywhere in the world through the internet using Raspberry Pi. This application also helps hospital staff to monitor basic vitals of the patient including the body temperature, heartbeat etc and helps the user to save a life by saving time searching for hospitals where a bed is available for treatment in the Emergency room. Smart IoT based emergency room consist of Android mobile device, cloud network, wireless means of communication, hardware having Wi-Fi module, that sends the data to the cloud which indicates the users about the status of bed. This system deploys pressure sensors on beds that will automatically sense pressure and indicates users regarding the status of the bed inside the emergency room of the desired hospital.

**Keywords**- Internet of Things, wireless fidelity, Electromyography, Electroencephalography, Electrocardiography, Blood Pressure, Emergency Room, Database.
Adaptive Approach for Optimization of Digital Images

Anuradha Bhatia¹, Ashok Kumar Jetawat², Chandan Singh D Rawat³

¹²PAHER, India
³Mumbai University, India

anubhatia1803@gmail.com

Abstract- The effects of the various artifacts and their effects on the images which are not visible by the naked human eye. To us everything seems to natural and perfect. The images are compressed in size for various artifacts and implementation requirements. The compression of images are needed without distorting the image when the need to transfer the image from one location to another. JPEG compression will result in two forensically significant fingerprints, as DCT coefficient quantization fingerprints and blocking artifacts. DCT coefficient quantization fingerprints. The common compression technique if not implemented leads to the distortion artifacts. DCT is a simple method for image compression. To see the implementation of effect of DCT on the image along with the variation in the parameters of coefficient.

Keywords- DCT, Quantization, Gaussian method, JPEG, Adaptive approaches.
Energy Efficient and High Performance FIR Filter Design on Spartan-6 FPGA

D M Akbar Hussain, Bishwajeet Kumar Pandey, Abhishek Kumar, Jason Levy, Pervesh Kumar, Bhawani Shankar Chowdhry, Abhishek Jain

Aalborg University, Denmark, Gyancity Research Lab India, SET, Sharda University, India, University of Hawaii USA, Sungkyunkwan University South Korea, Mehran University of Engineering & Technology Pakistan, Thapar University India

akh@et.aau.dk, gyancity@gyancity.com, abhishekmth97@gmail.com, jlevy@hawaii.edu, itspervesh@skku.edu, bhawani.chowdhry@faculty.muet.edu.pk, abhishek.jain@thapar.edu

Abstract- In this paper, we are going to design the energy efficient Gaussian low pass FIR filter on spartan-6 FPGA. To make an energy efficient filter, we have used different methods in this paper like capacitance scaling, frequency scaling, so then we analysed the demand of power by Gaussian low pass FIR filter. The frequency range which is used in this paper is 1 GHz, 2GHz, 2.5GHz, 5 GHz, 10 GHz and the range of capacitance which we have used in this paper is 5pF, 10pF, 25pF, 40pF and 50 pF. An FIR filter always remnants in linear phase with the help of symmetric coefficients and this is the very useful feature of the FIR filter for phase sensitive application like data communications etc. At present there are many different methods for communications and networking. So, in this paper, we have designed an energy efficient FIR filter and that design will faster than traditional design.

Keywords- FIR filter, Gaussian, FPGA, energy efficient
Investigation of Internet of Things handover process for Information Centric Networking and Proxy Mobile Internet Protocol

Azana Hafizah Mohd Aman, Aisha Hashim and Huda Adibah Mohd Ramli
The National University of Malaysia, Malaysia
azana05@yahoo.com, aisha@iium.edu.my, hadibahmr@iium.edu.my

Abstract- Internet of Things (IoT) technically connects billions of objects to the Internet. The IoT is divided between the technology and the service itself. As a result, it is puzzling to join data from many contexts and services. This reason has motivated proposals to develop solutions that can overcome existing puzzles of limitations in terms of mobility, security, scalability, and communication reliability. The purpose of this paper is to quantitatively evaluate two networking protocols that are possible to support acceptable mobility performance for IoT. The protocols are Information Centric Networking and Proxy Mobile Internet Protocol. The evaluation parameters are packet loss and service recovery time. The metrics are extracted from the handover process flow for each network protocol.

Keywords- Handover, Information Centric Networking, Proxy Mobile Internet Protocol, Packet Loss, Service Recovery Time.
Load status evaluation for Load Balancing in Distributed Database Servers

1Dildar Husain, Mohammad Omar, Khaleel Ahmad,
2Vishal Jain and Ritika Wason

1Maulana Azad National Urdu University India,
2Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), India

dildarhussainkhan786@gmail.com, omarmanuu@gmail.com,
khaleelamna@gmail.com, mca.bvicam@gmail.com,
rit_2282@yahoo.co.in

Abstract- Distributed database servers are very popular because it provides data availability, reliability, replication, partition and homogeneous/heterogeneous software and hardware. In this paper we are going to propose a methodology for load status evaluation of database servers for balancing the load on it by generating the status of the load with the help of some important parameters. On the basis of this status the clients/users requests can be sent on another database in distributed databases through which we can balance the load of distributed databases.

Keywords- Load balancer, D Balancer, balance controller, M/M/c: ∞/∞ model, M/M/c: N/∞ model, bully algorithm, db
Novel Framework for Handwritten Digit Recognition through Neural Networks

Manjot Kaur, Tanya Garg, Ritika Wason and Vishal Jain

Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), India

manjot.kaur97@gmail.com, tanya.pathak@gmail.com, rit_2282@yahoo.co.in, drvishaljain@yahoo.com

Abstract- The biggest challenge for natural language processing systems is to accurately identify and classify the handwritten characters. This manuscript aims to propose a novel neural network based framework for handwritten character recognition. Initially the framework has been simulated only on digits through 50,000 training data samples, 10,000 validation data set and 10,000 test data set, accuracy of 96.08% was finally achieved.

Keywords- Neural Networks, handwritten Digit Recognition, Natural Language Processing.
Cost-effective remote energy monitoring using
the ESP8266 Node MCU

Arthur James Swart

Central University of Technology, South Africa

aswart@cut.ac.za

Abstract- Energy monitoring is critical to ensure the sustainability of a renewable energy system. It further makes possible the introduction of energy conservation, reduction and optimization. To achieve this for an off-grid system, or for numerous research sites, requires the use of remote energy monitoring where various parameters may be visually reviewed from anywhere and anytime using an operational internet connection. Various commercial products exist to fulfil this need that may prove expensive and cumbersome to use. The purpose of this paper is to present a cost-effective remote energy monitoring system using the ESP8266 NodeMCU. The research site was the city of Cape Town that is known for its Mediterranean climate. Results indicate that a simple data logging interface circuit, a ESP8266 NodeMCU, an ADC, a 3.3 V regulator, a LED lamp and a reliable WiFi network is all that is required to monitor the energy yield of a pico-solar system along with the ambient temperature. Watt Hours per day produced over a 6-month period by a 10 W PV module is shown along with the cloud cover percentage. Average Watt hours per day for July and August was 39,3 Wh/day and for October and November it was 51,8 Wh/day. It is recommended that more of these cost-effective remote energy monitoring systems be deployed across a number of research sites to enable the collection of reliable empirical data that can be used to optimize the design of off-grid solar energy systems.

Keywords- cloud storage, data logging, PV, Renewable.
Consideration of net weights for performance driven routing

Geetanjali Udgirkar, G Indumathi

CMRIT, India
Cambridge Institute of Technology, India

hi2geetu@gmail.com, indumathi.ece@citech.edu.in

Abstract- In today’s VLSI technology, interconnect delay is the predominant factor in determining the speed of the final chip. Considering the complexity and size of today’s VLSI designs, timing driven VLSI routing is very challenging problem. Methods/Statistical analysis: The obvious method is to assign weights to the nets of a given route and perform timing driven routing. There are few works in the literature on net-weighting-based timing driven routing. Findings: Based on the criticality of the nets, by assigning weights to the nets in two methods discussed in the paper, we present two novel timing driven routing algorithms. In the first method, a constant is raised to the power of a variable exponent for weight assignment, whereas, in the second method, a variable exponent is raised to the power of a constant. These weights are considered during timing driven VLSI routing for an FPGA using VPR routing tool. Improvements: The proposed methods show significant improvement in timing over VPR routing tool. We obtain improvement of 14.65% and 26.85% using the methods MethodA and MethodB respectively, over VPR. Keywords: VLSI routing, Global routing, Net weighting method.

Keywords- net weights, global routing, timing driven, chip performance.
Enhanced Versions of PEGASIS Routing Technique for WSNs: A Survey

Abhilasha Jain and Ashok Kumar Goel

GZS Campus College of Engineering and Technology, Maharaja Ranjeet Singh Punjab Technical University, Punjab, India

abd_jain@rediffmail.com, ashokkgoel1@gmail.com

Abstract- An efficient routing in Wireless Sensor Networks (WSNs) helps to utilize the network energy economically to escalate the lifetime of the network. PEGASIS is a forerunner for chain-based routing algorithm designed with aim to enhance network lifetime. But the algorithm suffers from problems like data redundancy, long link formations, large latency period and so on. Many researchers propounded the modified algorithms for PEGASIS to overcome one or more problems associated with PEGASIS. An effort has been made to classify the chain-based routing algorithms for WSN based upon their features. This paper presents a literature survey of most representative chain-based techniques under each category. Finally, some open issues concerning the future design of chain-based routing algorithms have also been presented.

Keywords- WSN, PEGASIS, Chain-based, Routing, Protocols, Algorithms.
Evaluating multiple tilt angles using an innovative jig with a singular PV module

Pierre Hertzog and Arthur James Swart

Central University of Technology, South Africa

phertzog@cut.ac.za, aswart@cut.ac.za

Abstract- Researchers need reliable and accurate recording instruments or systems to obtain specific data for their research. Customizable systems are not always commercially available or may be too costly to obtain. The purpose of this paper is to present an innovative jig that can be used to automatically adjust a singular PV module to different tilt angles throughout the day, while simultaneously recording and storing specific data for future analysis. The analysis should provide answers as to which tilt angle enables the highest yield of output power for a specific environment. In order to demonstrate the operation of the designed system, voltage and current values of a 20 W PV module were recorded for nine different tilt angles and at 10-minute intervals during the solar productive period of the day. The results were evaluated, and it was found that the recorded results from the designed system correlates well with previous research resulting in its validity. It is recommended that the designed innovative jig be used to record data from a singular PV module at multiple tilt angles under various environmental conditions.

Keywords- Solar radiation, Electronic measurements, Arduino.
Optimization of power to achieve intended capacity in inter-cell interference of visible light communication network

Agha Yasir Ali, Rafay Muhammad Khan, Ume Laila, Muhammad Ibrar-Ul-Haque and Amber Israr

Sir Syed University of Engineering & Technology, Pakistan

aghayasirali@hotmail.com, engr.muhammad.rafay@gmail.com, ulaila@ssuet.edu.pk, mihaque@ssuet.edu.pk, aisrar@ssuet.edu.pk

Abstract- In this article, a novel algorithm is proposed to eliminate the inter-cell interference (ICI) for Visible Light Communication (VLC). The proposed algorithm is based on Hadamard Code (HC) and pulse amplitude modulation (PAM). Four schemes of HCs distribution between nine cells are separately designed and tested within a room to mitigate the ICI, whereas PAM is used to improve data rate. The primary objective of this research is to evaluate the amount of power utilized by four proposed schemes to obtain the channel capacity without interference (CCWI). However, the higher order of PAM (HOP) uses high average power. This increases the ICI which is diminished by using additional power to achieve the CCWI. Therefore, predetermined power is derived for the receivers based on ICI. Moreover, theoretical SER is derived to achieve the trade-off between SER performance and flickering in the room. This is done by choosing positive and negative amplitude from DC bias (PND). The designed four schemes are validated by using computer-based simulation on MATLAB for VLC. The simulated results show that the overall performance of the 4th scheme is power efficient as compared to other three schemes.

Keywords- Visible light communication, Inter-cell interference, Hadamard code.
Predicting Student Academic Performance using Data Generated in Higher Educational Institutes

Areej Fatemah Meghji, Naeem Ahmed Mahoto, Mukhtiar Ali Unar and Muhammad Akram Shaikh

Mehran University of Engineering and Technology, Jamshoro, Pakistan

areej.fatemah@faculty.muet.edu.pk, naeem.mahoto@faculty.muet.edu.pk, mukhtiar.unar@faculty.muet.edu.pk, akramshaikh@hotmail.com

Abstract- The analysis of data generated by higher educational institutes has the potential of revealing interesting facets of student learning behavior. Classification is a popularly explored area in Educational Data Mining for predicting student performance. Using student behavioral data, this study compares the performance of a broad range of classification techniques in an attempt to find a qualitative model for the prediction of student performance. Rebalancing of data has also been explored to verify if it leads to the creation of better classification models. The experimental results, validated using well-established evaluation matrices, presented potentially significant outcomes, which may be used for reshaping the learning paradigm.

Keywords- Educational data mining, Student performance prediction, Education, Machine learning.
Advanced Modulation Scheme for Visible Light Communication

Agha Yasir Ali, Razia Zia, Lubna Farhi, Sadia Ahmed, Ume Laila and Muhammad Ibrar-Ul-Haque

Sir Syed University of Engineering & Technology, Pakistan

aghayasirali@hotmail.com, raziamaroof@yahoo.com,
lfarhi@ssuet.edu.pk, sadiah_ahmed@live.com,
ulaila@ssuet.edu.pk, mihaque@ssuet.edu.pk

Abstract- In this paper, an improved version of existing modulation schemes is investigated by inserting Hadamard codes (HC) at the peak slot of each symbol for the visible light communication (VLC) system. The performance of the proposed scheme is analyzed and compared with existing schemes on-off keying (OOK), pulse position modulation (PPM), differential PPM (DPPM), pulse amplitude modulation (PAM), differential amplitude PPM (DAPPM) and differential pulse interval modulation (DPIM). Moreover, the symbol error rate (SER) for kth PAM is derived for d_s distances between symbols. The performance in symbol error rate (SER) is improved by introducing the positive and negative amplitudes (PNA) levels with respect to DC-bias. The theoretical and simulation results show that the proposed scheme outperforms the existing schemes in terms of bandwidth, and transmission capacity.

Keywords- Hadamard Code Matrix, Modulation, Visible Light Communication.
Study on the implementation of a Knowledge Management in a Moroccan public administration: "Case study of the Regional Academy of Education and Training in Casablanca - MOROCCO"

1Yousaf Khiat, and 2Azeddine Khiat

1The Ministry of National Education, Vocational Training, Higher Education and Scientific Research, Morocco,
2ENSET Mohammedia, Morocco

youssefkhiat44@gmail.com, azzeddine.khiat@gmail.com

Abstract- The following article addresses the issue of setting up a Knowledge Management (KM) system in the Regional Academy of Education and Training (AREF) of Greater Casablanca in Morocco. We conducted our study through a questionnaire and interview survey to solicit 42 executives, representing 23% of all AREF administrative staff. So, we approached; in the first place; the problem of Knowledge Management (KM) in the AREF by a theoretical apprehension centered on the concept and its definitions. Then, and through the results of the field study, we made recommendations and proposals divided into three sections: (i) Organizational; (ii) Human and (iii) Technological. Finally, as it is a long-term project for structuring change in culture, we recommend that it be supported by change management measures.

Keywords- Knowledge management, information system, knowledge transfer, knowledge capitalization.
Abstract- This study is aimed at the discourse of Islamic thought, especially in relation to the reality that occurs among the public about the lactation issues and challenges. This study can also help Muslims in understanding and practicing the legal rulings related to mother's breast milk. This research presents such a service based mobile application that assists Muslim/Muslemah community to enable users to get answers on their questions about the Law of Subsidiaries of Islamic Suspension which is in the issue of Mahrem, socialization, how to give milk and so on. Moreover, users not only gain knowledge, but also help them to ask their questions easily as they only need to use this app to communicate with ustaz / ustazah and be able to communicate with donours or receivers of the milk. i-MumMilk Care mobile application is flexible, user-friendly, portable, and support dynamic information. The application offers a set of services to Muslims through their Smartphone or similar smart device.

Keywords- Lactation, Halal milk, Mahrem, Mobile Application Muslims community.
Using Smartphone Application to Notify Muslim Travelers the Jama’ Qasar Pray, Azan Times and Other Facilities

Yousef El-Ebiary

Universiti Sultan Zainal Abidin, Malaysia

dr.y.elebiary@gmail.com

Abstract- This paper presents a service based mobile application that assists Muslim tourists traveling to any country. Detecting the real needs of the Muslim tourist is based on context management which is a key element in the MUSLIM TRAVEL-Software mobile application. The application provides Muslim tourists with context-aware information about the pray time called “Azan”, Halal food location in non-Islamic countries, to show Muslims travelers during their trip the Jama’ and Qasar pray zone according to Islamic Sharee’a concept and other useful facilities that maybe needed. MUSLIM TRAVEL-Software application is designed as client-server architecture and it uses GPS based location to provide a visual aid using Google map. MUSLIM TRAVEL-Software mobile application is flexible, user-friendly, portable, and support dynamic information. The application offers a set of services to Muslim tourists through their Smartphone or similar smart device.

Keywords- Halal food, Mobile Application, Muslim tourists.
A Lexicon based Approach Towards Concept Extraction

Anoud Shaikh, Naeem Ahmed Mahoto and Mukhtiar Ali Unar

Mehran University of Engineering and Technology, Jamshoro, Pakistan

anoudmajid85@gmail.com, naeem.mahoto@faculty.muet.edu.pk, mukhtiar.unar@faculty.muet.edu.pk

Abstract- The emergence of digital media has tremendously increased amount of unstructured data. Recently 80% of data, generated over web, is in unstructured format. This immense amount of data is a great source for the knowledge discovery and thus, may be utilized for extracting purposeful information. This study adopted lexicon based approach for automatic concept extraction from online news stories and events. An application prototype has been developed to demonstrate the applicability and effectiveness of the adopted approach. The extracted knowledge about news stories, articles and blogs is essential in understanding in-depth information for news analysts. This knowledge plays vital role towards building societies, since media is considered as an opinion maker for its audience.

Keywords- online news, unstructured data, concept extraction.
Mapping land cover damages in mega floods through integration of remote sensing and GIS techniques

1Sikandar Ali, and 2Dr. Gasim Alandjan

1Indus University, Karachi, Pakistan,
2Yanbu University College, Yanbu, Saudi Arabia

sikandar.shah@indus.edu.pk, alandjanig@rcyci.edu.sa

Abstract- Today we are encircled by multiple problems, such as global warming, drought, wildfires, Hurricanes and tropical storms etc; among them flooding is one of the major problems; however the flood hazards are probably rising due to an amalgamation of environmental and socio-economic effects. Therefore flood safety measurements are more essential to avoid barriers toward major development in society associated to environment, which requires modern and accurate steps for preventing the impacts of flood on population and properties. Floods are among the most destructive physical vulnerabilities on earth’s surface, which cause major economic and social damages rather than any other natural incidence. However the flood problem begins because the human beings are using river floodplains. In this research our focus is to identify and measure extent and impacts such as Infrastructural, loss of Agriculture, Built-up (Houses), natural vegetation and property along Indus river due to heavy flooding of 2010, to achieve our purpose, two different years landsat imageries before and after flood i.e September 2009 and September 2010 have been applied and the desire results were achieved through integration of Remote Sensing (RS) and Geographical Information System (GIS) techniques. With the help of RS data, hazardous impacts of flooding 2010 have been observed on the bases of different factors which were performed on Arc Map 10.3.1, Erdas Imagine 9.2, eCognition Developer 64. After performing different analysis the major losses have been observed which are shown in table 1to4 and further highlighted in Figure 5a to 8g.

Keywords- Land-sat 5 Thematic Mapper (TM), Flood Hazards, OBE classification, Error Matrix, Accuracy assessment.
An Economical and Relatively Efficient Implementation of the Real-time Solar System

Sabir Ali Kalhoro,  
Prof. Dr. Engr. Sayed Hyder Abbas Musvi, Sikandar Ali,  
Saadullah Rahoojo and Asim Nawaz

1Department of Electronics Engineering NED University of Engineering and Technology Karachi Pakistan,  
2Indus University, Karachi, Pakistan  
3Indus University, Karachi, Pakistan  
4Department of Geography, University of Sindh Jamshoro  
5Department of Geography University of Karachi, Pakistan

Sabir13es66@gmail.com, dean@indus.edu.pk, sikandar.shah@indus.edu.pk, rahoojosaad@gmail.com, asimpmd@gmail.com

Abstract- The developing countries are facing energy deficiency problems and the alternative designed systems i.e. the bi-facial solar system which are available in the foreign markets having variety of the advantages and efficiency but they are too costly. Therefore there is a dire need of low price and a simple solar system to overcome the required need of the electricity. In this research we have designed a system which reflects the bi-facial concept with economical prize for the developing countries. However efficiency of proposed solar system was checked in the sunny day and its observation was closely related to the real time bi-facial solar system. The system has been designed by combining the two equal watt solar penal having anti parallel alignment with each other. The rear penal of the design system is supported by concentrator for strengthening the efficiency of the scattered irradiation. The scattered irradiation generates extra energy due to the design structure of the proposed system. The voltage of the system is conjointly increases slightly as the timely increasing irradiation strength. The power of system increases with the increasing voltage proportional relationship with the current. The proposed system verifies the voltage, current and power measurement from all location of the calculation.
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A Novel Design and Simulation for Highly Nonlinear Solid-Core Photonic Crystal Fiber

Arati Kumari Shah and Rajesh Kumar

North Eastern Regional Institute of Science and Technology,
Itanagar, Arunachal Pradesh, India

arati.shah20@gmail.com, itsrk2006@gmail.com

Abstract- This paper manages a novel structure of solid-core photonic crystal fiber (PCF) which compares the PCF characteristics. For example, chromatic dispersion, effective area, loss of confinement and non-linearity using Comsol Multiphysics software based on the finite element method (FEM). The simulation results show that proposed PCF exhibits high nonlinearity of 0.51927 m²/watt at the working wavelength 0.5μm along with a maximum number of zero dispersion wavelength (ZDW), a low effective area of 6.78*10⁻¹³ m² and very low confinement loss of 6.96*10⁻⁹ 1.35μm for R=0.9(diameter pitch ratio). Therefore, the proposed PCF is highly nonlinear and minimum dispersion which makes it useful for various applications like supercontinuum generation, biomedical imaging etc.

Keywords- Solid-Core Photonic Crystal Fiber, Zero Dispersion Wavelength, Non-Linear Coefficient, Effective Mode Area Confinement Loss, Comsol Multiphysics.
Modeling of Flux linkage Characteristics of Switched Reluctance Motor

Anwar Ahmed Memon, Ali Asghar Memon, Muhammad Aslam Uqaili and Mukhtiar Ali Unar

MUET, Pakistan

anwar.memon@faculty.muet.edu.pk,
ali.asghar@faculty.muet.edu.pk,
aslam.uqaili@faculty.muet.edu.pk,
mukhtiar.unar@faculty.muet.edu.pk

Abstract- The increasing popularity of the switched reluctance machine has created more challenges to present it as a good performer machine under different operational conditions. For modeling and simulation of the machine, the necessity of static characteristics, in particular, flux linkage characteristics which look like the base stone for initialization of simulation is unavoidable. This paper describes a set of equations for modeling of the flux linkage characteristics of switched reluctance machine and also hardware for the 3-phase machine is presented.

Keywords- Switched reluctance machine, flux linkage characteristics, inductance profile.
Insulation material “Fibrol”

Armands Grickus
Liepaja University, Latvia
armands.grickus@liepu.lv

Abstract- Described in article new insulation material could be produced from recycled materials so very cheap raw materials. So, it is promising for use also in countries with limited income level and readily available components. Mixture of fiber and foamed materials need not to apply certain binders or adhesives what make production costs even lower. Superior thermal performance makes it among best insulation materials.

Keywords- new insulation material, foam and fiber mixture recycled raw materials.
Deep Architectures for Human Activity Recognition using sensors- A Survey

Zartasha Baloch, Faisal Karim Shaikh and Mukhtiar Ali Unar

Mehran University of Engineering & Technology, Jamshoro, Pakistan

Zartasha.baloch@faculty.muet.edu.pk

Abstract- Human activity recognition (HAR) is a renowned research field in recent years due to its applications such as physical fitness monitoring, assisted living, elderly-care, biometric authentication and many more. The ubiquitous nature of sensors makes them a good choice to use for activity recognition. The latest smart gadgets are equipped with most of the wearable sensors i.e. accelerometer, gyroscope, GPS, compass, camera, microphone etc. These sensors measure various aspects of an object, and are easy to use with less cost. The use of sensors in the field of HAR opens new avenues for machine learning (ML) researchers to accurately recognize human activities. Deep learning (DL) is becoming popular among HAR researchers due to its outstanding performance over conventional ML techniques. In this paper we have reviewed recent research studies on deep models for sensor based human activity recognition. The aim of this article is to identify recent trends and challenges in HAR.

Keywords- Deep Learning models, Sensors, Human activity recognition.
Spatial Analysis of Annual and Seasonal Sunlight Variation through GIS Kriging Techniques

1Asim Nawaz, 2Sikandar Ali, 3Sabir Ali Kalhoro, 4Saadullah Rahoojo, 5Muneer Abbas and 6Muhammad Shahid

1Department of Geography, University of Karachi, Pakistan,
2Indus University, Karachi, Pakistan
3Department of Electronics Engineering NED University of Engineering and Technology Karachi Pakistan
4Department of Geography, University of Sindh Jamshoro, Pakistan
5Department of Energy and Environment Hamdard University Karachi, Pakistan,
6Department of Electronic Engineering, Dawood University of Engineering and Technology, Karachi, Pakistan

asimpmd@gmail.com, sikandar.shah@indus.edu.pk, Sabir13es66@gmail.com, rahoojosaad@gmail.com, 10memuneer@gmail.com, engr_shahid82@yahoo.com

Abstract- Today the developing countries are facing multiple types of crises especially in the term of energy crises. Also Energy has great worth because it is very essential for the development of any society as well as for the adequate standard of living, every country requires the energy i.e. Electricity, as to carry out the basic activities, however as the population is increasing rapidly so the demand of energy (electricity) is also increasing and if the required demand of energy is not supplied then it creates the energy shortage, therefore we require the alternative resources (solar energy), to control the energy crises. Sunlight has a lot of importance because it is the renewable resource and is the best alternative to control the energy crises. Pakistan is a country which is facing the energy crises. These crises take the serious shape of torment in summer season, especially in Sindh province. However due to its geographical location the province receives the sufficient quantity of sunlight in whole year. In this research our focus is to spot the most appropriate locations for the efficient utilization of solar energy in different seasons, based on pointed data, derived from different meteorological observatories over the last thirty years. And with the help of Geographic information system the annual average sunlight of the province has been observed which is 8.5 hrs /day and the central part of the province is spotted, which is more suitable for solar plants, because the temperature remains high in this part.

Keywords- Sunlight, Spatial Variation, Pointed Data, GIS, Kriging Interpolation.
To Build Corpus of Sindhi Language

1Fida Hussain, 2Mashooque Ahmed Memon, 3Haque Nawaz Lashar and 4Sayed Hyder Abbas Musavi

1Dawood University of Engineering & Technology Karachi, Pakistan, 2Benazir Bhutto Shaheed University Lyari Karachi, Pakistan, 3Sindh Madressatul Islam University, Karachi, Pakistan, 4Indus University, Karachi, Pakistan

fidahussain.khoso@duet.edu.pk, pashamorai786@gmail.com, hnlashari@smi.edu.pk, dean@indus.edu.pk

Abstract- The present day state of Sindhi corpus construction is elaborated in detail in this paper. The issues like corpus acquisition, tokenization and preprocessing have been analyzed and discussed minutely for Sindhi corpus enhancement. Initial observations and results are included for letter unigram, bigram and trigram frequencies. There has been discussed the present status of Sindhi corpus in perspective of restriction & future work. Orthography and script was also explored in this paper with reference to corpus development.

Keywords- AI, NLP, Corpora, Linguistic, Lexicon, Phoneme
Wind and Solar Energy Potentials Around Southern Sindh & Southern Baluchistan Provinces Especially Karachi of Pakistan

Muhammad Shahid, Sabir Ali Kalhoro, Darakhshan Ara, Noor Bano and Rubina Perween

1Dawood University of Engineering & Technology Karachi Pakistan,
2Department of Electronics Engineering NED University of Engineering and Technology Karachi Pakistan,
3Department of Humanities, Mathematics and Basic Sciences, Dawood University of Engineering and Technology, Karachi, Pakistan,
4Indus University, Karachi, Pakistan,
5Department of Chemistry, Federal Urdu University of Arts, Sciences and Technology, Karachi

engr_shahid82@yahoo.com, Sabir13es66@gmail.com, ara.chemistry@yahoo.com, Zarahassan497@gmail.com, Rubinaperween@fuuast.edu.pk

Abstract- Electrical energy has a vital place as it amounts to being the basic necessity of sustainable life and necessitates itself for the development of human capital leading to general economic uplift of a nation. Pakistan has remained in the serious shortage of electric power leading to adverse effects on the state. Around 70 percent of Pakistanis are living without a stable electric supply. Those who are lucky enough to have access to electricity undergo around 12 to 14 hours of load shedding. Pakistan is always in the lack of sufficient conventional sources of energy. Adding to this is the fact that Pakistan has not made any significant steps to tap renewable energy resources like wind and solar energy. It seems very natural for Pakistan to employ the natural sources of energy which are yet too tapped and coming unto the fulfillment of the shortage in the supply of energy.

In this paper, the existing potential of renewable energy resources is studied as a viable alternative to the current state in the energy supply and demand. Southern Pakistan is presented to hold key renewable resources such as wind and solar energy in order to address the energy shortfall. Southern Pakistan, mainly coastal regions, possesses wind and solar
potential. The paper choose selected areas in southern Pakistan containing an adequate level of wind power. The paper attempts to argue that renewable energy resources can meet the energy demand of the southern regions mainly coastal ones. The paper attempts to look at the current and future challenges in the transition to wind and solar power.

**Keywords**- Renewable Energy, Energy Potential, Energy Shortfall, Coastal Regions Study.
Comparative analysis of properties of wires from alloys of Al-REM system, obtained using the methods of continuous extrusion

S. B. Sidelnikov
Siberian federal university, Krasnoyarsk, Russia
sibdrug@mail.ru

Abstract- The article presents the results of experimental studies of the production technology of electrical wire made of aluminum alloy of the Al–REM system with content of rare earth metals in the range of 7-9% using continuous casting and extrusion processing methods. Continuous casting rods with a diameter of 12 mm, obtained by casting into an electromagnetic mold (EMM), were the starting material for research. Methods of continuous extrusion "Conform" and combined rolling-extrusion (CRE) were the main methods to obtain a billet for subsequent drawing. Deformation modes, methods of experiments and equipment for the implementation of two variants of the proposed technology using various methods of continuous extrusion described. At all stages of the technology, samples were taken and the mechanical and electrophysical properties of the obtained deformed semifinished products (ultimate tensile strength, elongation to failure and electrical resistivity) were studied. Application of the "Conform" method in industrial conditions using standard drawing routes allows obtaining a wire of small diameters with high strength properties, however, the plastic properties and values of electrical resistance do not correspond to the existing requirements of the technical specifications for its production. On the contrary, the plastic properties of hot-extruded rods obtained by the CRE method allow cold deformation using only one intermediate annealing. At the same time, the developed technology using continuous casting, combined rolling-extrusion, drawing modes and final annealing of a wire with a diameter of 0.5 mm provides the required level of plastic and strength properties, as well as minimum values of electrical resistance. The developed modes of deformation and heat treatment can be recommended for the industrial production of electrotechnical wire from high-alloyed Al–REM alloys.

Keywords- aluminum rare earth metals wire electromagnetic mold, continuous extrusion combined rolling-extrusion, drawing mechanical properties electrical Resistance.
Abstract- The main objective of this study is to determine the costs of radiology procedures in all units in the Department of Radiology in Universiti Kebangsaan Malaysia Medical Centre (UKMMC). In 2011, a total of 121,221 radiology procedures was done in the Department of Radiology. However, the estimating costs of providing these radiology procedures are not known. A cross-sectional study was conducted in all units and cost centric data mining based on costing activity method was used to evaluate the cost of radiology procedures. Information on seven cost components was collected for each procedure: human resources, consumables, equipment, reagents, administration, maintenance, and utilities. Findings of this study are very useful to UKMMC management since they help enhance the efficiency of services and reduce unnecessary radiology procedures in patients’ management.

Keywords- Cost centric data mining, Activity Based Costing, Radiological Procedures, Cost Components.
Study of Mobility Models for UAV Communication Networks

Haque Nawaz, Husnain Mansoor Ali and Shafiq Ur Rehman Massan

Shaheed Zulfikar Ali Bhutto Institute of Science and Technology Karachi
Dept. of Computer Science, Shaheed Zulfikar Ali Bhutto Institute of Science and Technology, and Sindh Madressatul Islam University Karachi, Pakistan

hnlashari@smiu.edu.pk, husnain.mansoor@szabist.edu.pk, srmassan@hotmail.com

Abstract- The Unmanned aerial vehicle communication network (UAVCN) is a group or swarm of unmanned aerial vehicles which can be used for specific military and civilian applications without human intercession. This network faces the design problem which is based on network mobility. The frequent topology changes affect the communication and collaboration among the UAVs (Unmanned aerial vehicles). To govern the movement pattern of UAVCN different mobility models needed to be studied in order to solve this communication issue. In this paper, mobility models are explored which provides the particular mobility pattern to resolve the problem of collaboration, communication and cooperation of UAVs. These models have been categorized in five groups and classified each group in detail. These mobility models provide the platform to understand and implement the unmanned aerial communication network for specific environment scenarios. The mobisim simulator tool is used to generate the mobility models trajectories for different mobility models.

Keywords- Mobility models, UAVs, UAVCN wireless communication.
Scalability Evaluation of VoIP and FTP performances on Next Generation Network

Faycal Bensalah, Ayoub Bahnasse and Mustapha El Hamzaoui

STIC Laboratory, Chouaib Doukkali University, Faculty of Sciences, Morocco
LMIE Laboratory, ISGA El Jadida, Morocco

f.bensalah@ucd.ac.ma, a.bahnasse@gmail.com elhamzaoui.m@ucd.ac.ma

Abstract- The telecommunications industry is currently moving towards the trade of Internet services. However, with the extension in terms of enterprises sites, the quality of transported traffic can be influenced. Given that the nature of deployed application vary periodically and become more and more demanding in terms of delays, the scalability need can lead to a dysfunction of the latter. In this paper, we will measure and evaluate the impact of multiples sites on the performances of the network and the transported applications. This study was done under the Riverbed Modeler simulator. The traffics used for the simulations are File Transfer Protocol (FTP) and Voice over IP (VoIP). The evaluation criteria are on the jitter, the end-to-end delay, and the VoIP loss rate. Concerning the FTP traffic, the chosen criterion is the loading delay of a file.

Keywords- VoIP, FTP, Riverbed Modeler, NGN, performances.
Social Media in Education: Experience of Kazakhstan University

Galiya Berdykulova, Aigul Niyazgulova and Nietzhan Ibragimov

International IT University, Kazakhstan
Al-Farabi Kazakh National University, Kazakhstan

Abstract- The purpose of the study is to investigate social media in higher school of Kazakhstan and offer ways to develop the methodology of social media strategy of the university, media education and media competence as premises to meet requirements of global competitiveness in the post-industrial society and digital era. The methodology of the research is based on conceptual statements of media education and personality development. Methods of empirical research have included synthesis of domestic and foreign experience, comparative analysis, a scientific experiment based on observation, questioning, and statistical processing of materials of research. As results, the methodology of the social media strategy of the university, the pedagogical aspect of phenomena of the media environment, media education, and media competence is done.

Keywords- media education, media competence the social media strategy of the university.
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<th>EXPRL: Experience And Prediction Based Load Balancing Strategy For Multi-Controller Software Defined Networks</th>
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**Abstract**- Software Defined Networks or SDN has proved itself to be backbone in network design of the new era and is quickly becoming an industry standard. It allows decoupling of control and data plane for efficient monitoring of the network traffic. These networks can be divided into two main classes – single and multiple controller SDN. A single controller is unable to control flows if number of switches connected to it increase up to a great extent and traffic generated by them overload the controller. In that case a pool of multiple controllers is a necessity. There each controller is initially connected to approximately same number of switches. Still if a controller feels overloaded then some of its switches are disconnected from it and connected to some comparatively under loaded controller to balance load in the network. The present article EXPRL proposes an experience and prediction based load balancing strategy that efficiently identifies overloaded controllers and selects target underloaded controllers to shift some load from the overloaded ones. Simulation results show that EXPRL enables the network to greatly increase network throughput and reduce network latency as well as migration cost than its state-of-the-art competitors.

**Keywords**- Actual call arrival rate, latency, load balance, overloaded controller, packet loss, predicted call arrival rate target controller, target switch, throughput.
Machine learning in Agriculture: Applications & Challenges

Azeem Ayaz Mirani, Dr Pardeep Kumar, Engr. Muhammad Suleman Memon, Dr Asif Ali and Mushtaque Ahmed Rahu

Shaheed Banzir Bhutto University Nawab Shah Sindh, Pakistan,
Quaid-e-Awam University of Engineering Science and Technology, Nawab Shah, Pakistan
University of Sindh Jamshoro Sindh, Pakistan
Shaheed Banzir Bhutto University Nawab Shah Sindh Pakistan
Quaid-e-Awam University of Engineering Science and Technology Nawab Shah, Pakistan

azeemayaz@sbbusba.edu.pk, pardeep.kumar@quest.edu.pk
 engrsuleman14@gmail.com, asifwaggan@gmail.com
 rahumushtaque@gmail.com

Abstract- Computational intelligence and machine learning technique are used to predict different agricultural crop status analysis for the accurate and time by time prediction of crop yield. IoT devices made easy to monitor and record real time parameters for the further evaluation of the raw data by applying different machine learning algorithms. It is easy to predict the crop by parameters including soil, water and air respectively. Computational image processing and machine learning techniques imperative process and evaluate captured pictures by different techniques. Implementing automated cameras and drone technology can easily extract the features of plant leaves characteristics. Image data acquisition can easily detect and estimate different parameters which can easily effects on crop yield. this study focuses machine learning applications and challenges in agriculture field. The study also focus important factors which are needed to be focus in agricultural machine learning.

Keywords- Machine learning, AI, Agriculture.
Improved Spider Monkey Optimization Algorithm to train MLP for data classification

Prabhat Ranjan Singh, Diallo Moussa, Xiong Shengwu, and Bikram Singh

Department of Computer Science, Wuhan University of Technology, China

prabhatranjansingh68@gmail.com, moussdiall@yahoo.com, xiongsw@whut.edu.cn, bikramsingh.singh55@gmail.com

Abstract- In this paper the modified Spider Monkey Optimization (SMO) with Multi-Layer Perceptron (MLP) is utilized to solve the classification problem on five different datasets. The MLP is a widely used Neural Network (NN) variant which requires training on specific application to tackle the slow convergence speed, and local minima avoidance. The original SMO with MLP experiences the problem of finding the optimal classification result; due to that the SMO is enhanced by other meta-heuristics algorithm to train the MLP. Based on the concept of no free lunch theorem, there is always a possibility to improve the algorithm. With the same expectation the performance of SMO algorithm is improved by using Differential Evolution (DE) and Grey Wolf Optimizer (GWO) algorithm to train the MLP. Likewise, the SMO-DE and SMO-GWO are two different concepts employed to improve the efficiency. The results of proposed algorithms are compared with other well-known algorithms such as BBO, PSO, ES, SVM, KNN, and Logistic Regression. The results show that proposed algorithm performs better than others or they are more competitive.

Keywords- Classification, Neural Network, Swarm Intelligence Evolutionary algorithm.
Design and Analysis of Fiber Bragg Grating

1Regina Mathias, 2Swarajit Pal and 3Dr. J Deenathayalan

1Bharathiar University Coimbatore, India
2The Oxford College of Engineering, Bangalore, India
3Gandhi Arts & Science College Sathyamangalam, India

reginamths@gmail.com, swarajitpalrajbari@gmail.com, jd10173@gmail.com

Abstract- To improve protection and pressure sensitivity of grating, the Fiber Bragg Grating should be packaged. For polymer package, metal-tube package and side-hole package, simulation is done in Ansys [1-2]. For polymer package it is observed that as the Poisson’s ratio increases, the material strain also increases; the metal tube package covers the pressure which is radial in nature, to increase its sensitivity; side-hole package is designed non-symmetrically by structure. It is found that metal tube package shows more sensitivity than any other grating system followed by polymer packaged, and side-hole package analysis and simulation maintaining similar conditions.

Keywords- ANSYS, Package, Fiber Bragg Grating, strain.
Detection of Malignant Tissue using Metal Dielectric Interface based Plasmonic Biosensor

1Nandhini V. L, 2Dr. Sandip Kumar Roy, and 3Dr. K. Suresh Babu

1ECE Department, Government SKSJTI College, Bangalore, India, 2ECE Department, AMC Engineering College, Bangalore, India, 3ECE Department, UVCE College, Bangalore, India.

sunandi7276@gmail.com, sandipr@hotmail.com, ksb1559@gmail.com

Abstract- Metal dielectric interface based Plasmonic biosensors commonly known as Surface Plasmonic Resonance (SPR) have found extensive application in analysis of bimolecular interactions (BIA) and detection of chemical and biological analytes, where they provide benefit of real-time, highly sensitive and label-free technology. In sensor development, sensitivity is an important parameter to evaluate the sensor’s performance. Among all the plasmonic configurations, waveguide coupled configuration is most effective. In a waveguide coupled configuration a waveguide and an SPR are coupled through an evanescent field in a distributed manner. This allows greater control over the interaction, may lead to greater sensitivity and also provide highly integrated, multichannel, robust sensing devices. Such devices are very small in size, light weight as compared to prism coupled configuration which are bulky. These devices are also capable of discriminating specific sensor responses from non-specific response, simultaneous detection of multiple analytes. In view of the aforesaid benefits of waveguide coupled SPR, our present work focuses on a dual channel integrated optical waveguide based on metal dielectric interface biosensor. To study the behavior of a waveguide coupled SPR sensor, we carried out analysis and simulation of SPR on multilayer geometries using TMM. First, we started with the analysis of a SPR in multilayer interface and observed the effects of material properties on SPR profile. Then we extended our analysis and analysis to multilayer planar waveguide and calculated the complex propagation constant of the gold sensing section of the device using TMM and Newton’s method for Lung Cancer and Breast Cancer infected tissue. Here the sensitivity of the sensor obtained is 300nm/RIU.

Keywords- Biosensor, Surface Plasmon Resonance, Refractive Index, Photonic Crystal, Malignant, Dielectric Interface, Plasmonic.
Abstract- The dead zone in the buck converter can be eliminated by integrating flyback converter with it. However, its input power factor (PF) is low when operated with constant on-time control (COTC). In this paper, a variable on-time control (VOTC) strategy is proposed for integrated buck-flyback converter (IBFC) with simple structure to obtain unity PF. By feed forwarding input and output voltage to change the on-time of both switches, high PF can be achieved. The operating principle of the IBFC is discussed with both types of control schemes and for verifying the effectiveness of VOTC scheme; simulations are carried out by using Saber simulator.

Keywords- integrated buck flyback converter, constant on time control, variable on-time control.
Energy Efficient Instruction Register for Green Communication

Shah Md Tanvir Siddiquee, Keshav Kumar, Bishwajeet Pandey, Abhishek Kumar

1Daffodil International University, Bangladesh
2Chitkara University Institute of Engineering & Technology, Chitkara University, Punjab, India
3Center of Energy Excellence, Gyancity Research Lab, Motihari, India
4SET, Sharda University, Gr Noida, India

tanvir.cse@diu.edu.bd, keshav.kumar@chitkara.edu.in, gyancity@gyancity.com, abhishekmth97@gmail.com

Abstract- Our work represents the interfacing of instruction register with FPGA. In this work we have taken three different FPGA of Virtex family that are Virtex 4, Virtex 5 and Virtex 6 and have observed the power variation of instruction register with this three FPGA. This experiment is done on a Xilinx 14.1 ISE design suite. And the power of instruction register with three FPGA is analyzed with an X Power tool. All the other chips power which is implanted on instruction register counts zero in total, dynamic and quiescent power consumption. In this experiment, only one LUT flip flop pair is used. On comparing the power of instruction register with the three FPGA of Virtex family, we concluded that 90 nm Virtex-4 FPGA requires the least power among all the three FPGA.

Keywords- Instruction register, FPGA, Virtex-4, Virtex-5, Virtex-6, Power analysis.
Novel Design and Modeling of Shutter Valves for Camless Engines

Muhammad Arsalan Jalees Abro, Irfan Ahmed Halepoto, Saifullah Samo and Dur Muhammad Pathan

Mehran University of Engineering & Technology, Jamshoro, Sindh, Pakistan

arsalan_jalees@hotmail.com, irfan.halepota@faculty.muet.edu.pk, saifullah.samo@faculty.muet.edu.pk, dur.pathan@faculty.muet.edu.pk

Abstract- For the intake of air fuel mixture and exhaust of gases camshaft operated valves are mounted on the cylinder head. In this paper we have proposed a novel physical model of a shutter valve to replace the traditional camshaft operated valve resulting in a camless four-stroke engine. Methods/Statistical Analysis: The lift control for the opening and closing of the intake and exhaust valves are monitored traditionally by a camshaft which is a mechanical component having fixed shape. Camless engines replaces the camshaft by allowing the control of valves through the Electronic Control Unit (ECU). The already developed valves have limitations in terms of lift, life expectancy or higher costs. This research work proposes a novel shutter valve design instead of a poppet valve for intake and exhaust of four-stroke engines. These valves are then operated directly by an ECU and controlled through pulse width modulation. Findings: The proposed variation in shutter valve design optimally adjusts and controls the fuel intake amount and the flow of exhaust gases in and out of the cylinder respectively. The opening of valve can be set to maximum or at a desired angle so that the engine can run according to the driver’s requirement. Application/Improvements: The novel design of shutter valve will reduce the engine cost and will improve the fuel economy. At the same time providing complete control to driver’s performance preferences.

Keywords- Camless engine, Camshaft engine, four-stroke engine Shutter valve, poppet valve.
RESIDENTIAL COMMUNITY MICRO GRID LOAD SCHEDULING AND MANAGEMENT SYSTEM USING COOPERATIVE GAME THEORY

Sania Khaskheli and Irfan Ahmed Halepoto

Mehran University of Engineering & Technology, Jamshoro, Pakistan

sania.14es.01.muet@gmail.com, irfan.halepoto@gmail.com

Abstract- This paper proposes a residential community based microgrid using cooperative game theory to share excessive energy within a community’s neighbor homes for optimal load scheduling and management. Methods/Statistical Analysis: The proposed model is a grid connected residential community where smart homes are connected through central energy management system (EMS) to share the benefits of excessive distributed energy resources (DERs) from solar PV or wind turbine by selling to other community residents at a price lower than the utility grid but higher than the feed-in tariff. The community smart homes are categorized as Externally Importing Homes, Internally Exporting Homes and Externally Exporting Homes which are further classified as passive consumers, active prosumers and proactive prosumers based on the facilities they possess in form of DERs and battery storage (BS). Findings: With the cooperative energy transaction mechanism, the smart community homes after fulfilling their own load requirements can place the excessive energy on community poll using decentralized or centralized approach through peer to peer trading or smart community manager (SCM) respectively. The excessive energy can be sold or purchased to and from other community homes as per some defined preferences and priorities. This will benefit the entire community in terms of cost compared to the utility grid’s Time of Use (ToU) pricing. Application/Improvements: Proposed system will not only share, schedule and manage the community load optimally but will reduce the overall energy cost, system operational stress, improves the system operational efficiency and reduces the carbon emission.

Keywords- Residential Microgrid, Distributed Energy Resources Cooperative Game Theory, Load Scheduling, Energy Management System.
Boundary Conduction Mode Modified Buck Converter with Low Input Current Total Harmonic Distortion


Mehran University of Engineering & Technology, Jamshoro, Pakistan

hakeem.memon@faculty.muet.edu.pk, zubair.memon@faculty.muet.edu.pk, noor.nabi@faculty.muet.edu.pk, anwar.sahito@faculty.muet.edu.pk, ashfaque.hashmani@faculty.muet.edu.pk

Abstract- Buck power factor correction (PFC) converter is widely used for a broad range of AC/DC applications because of its many advantages like protection against short circuit, high efficiency at universal input voltage, low output voltage, less voltage stress on the switch, low inrush current and low component cast. However the inherent dead zone introduces a large harmonic distortion in the average input current, resulting in a low power factor (PF) and high total harmonic distortion (THD). A constant on-time controlled boundary conduction mode (BCM) buck-flyback converter is introduced in this paper. It can achieve low input current THD and high PF. The operating principle of the traditional and proposed converter is discussed and the effectiveness of proposed topology is evaluated by simulation results.

Keywords- Boundary conduction mode, power factor, total harmonic distortion, buck converter.
A Novel Low Power MUX based Dynamic Barrel Shifter using Footed Diode Domino Logic

1Bharathesh Patel N and 2Dr. Manju Devi

2G. MADEGOWDA INSTITUTE OF TECHNOLOGY, INDIA,
2THE OXFORD COLLEGE OF ENGINEERING, INDIA

bharatheshpatel@yahoo.com, manju3devi@gmail.com

Abstract- The choice of the Complementary Metal Oxide Semiconductor logic to be used for implementation depend on the given specified optimization and the performance constraints that the finished chip is required to meet. Dynamic logic provides better performance for higher fan in and complex logic circuits and also with the increasing level of integration, high speed and low power dissipation have become the mandatory requirements for any logic design along with the performance. Many design logics are available within Dynamic Logic stream. One of the popular logic is the Domino logic (DL) for low power dissipation and high-speed. This paper presents a comparative study and analysis of Barrel Shifter using Pseudo nMOS multiplexer and Footed Diode Domino (FDD) multiplexer.

Keywords- Domino, CMOS, Dynamic Logic, Precharge, Barrel, Shifter Pseudo, nMOS
Decentralized Approach to Secure IoT based Networks using Blockchain Technology

Urooj Waheed, M. Sadiq Ali Khan, Samia Masood Awan, Muhammad Ahsan Khan and Yusra Mansoor

Department of Computer Science, University of Karachi, Pakistan
Go4 Blockchain, Pakistan
FAST, Pakistan

urooj050@hotmail.com, msakhan@uok.edu.pk
samia_masood@hotmail.com, mahsankhan0@gmail.com
k180877@nu.edu.pk

Abstract- Emerging Technologies of Fourth Industrial Revolution such as Internet of Things has the potential to change the way we are living today and interact with information systems and devices. From a small device like a simple glucose monitor of healthcare sector to Autonomous cars from transportation industry, IoT plays a vital role in connected information, human interaction and data. At the same instance, IoT deals with personalized human and quite important data from various types of devices, a small loophole can be a reason to bring disastrous impact on human lives, a minor vulnerability in IoT networks may challenge the complete cycle of IoT network. It may generate calamity type of event, not only in information systems but also on the physical human lives as well, because of a single point of failure as IoT based networks usually deployed on centralized systems. In this paper, we are proposing a decentralized approach to remove single point of failure with the help of new layer of security based on Blockchain technology as advancement in securing IoT networks.

Abstract- In this paper, we have proposed, designed and simulated a grid connected residential smart home system benefiting from hybrid energy system (HES) for optimal balancing and control of a dynamic load using Feed-in Tariffs (FiT) tariffs by increasing the onsite self consumption of solar PV system. Methods/Statistical Analysis: To achieve the object function, two different PV system configuration scenarios were designed, simulated and analyzed for different case studies. In first scenario, PV system without battery backup storage system (BBSS) under FiT scheme with flat tariffs was investigated for a typical day of winter and summer. In second scenario, PV system with BBSS under FiT scheme with ToU tariffs was investigated again for a typical day of winter and summer. Findings: The optimal balancing and dynamic load control can be achieved by increasing the penetration level of solar PV by maximizing the onsite self consumption of PV system, minimizing the grid electricity import in high ToU tariff periods, charging the battery during low ToU tariffs, discharging the battery during high ToU tariffs and exporting the excessive PV generation in peak PV generation periods especially in summer season. Application/Improvements: The simulated results suggest that significant revenue can be saved and optimal balancing and control can be achieved when PV system is configured with BBSS under FiT scheme by utilizing ToU tariffs. The proposed will be more cost effective and optimal control can be achieved if implemented to residential community microgrids by using cooperative game theory approach.

Keywords- Solar PV system, Battery Backup storage system, Hybrid Energy System, Feed-in Tariffs, Time of Use tariffs
Data Preprocessing: A preliminary step for web data mining

Huma Jamshed, Muhammad Sadiq Ali Khan, Muhammad Khurram, Syed Inayatullah and Sameen Athar

University of Karachi, Pakistan
Sir Syed University of Engineering and Technology, Pakistan

humajamshed@yahoo.com, msakhan@uok.edu.pk, muhammadkhurram@gmail.com, inayat@uo.edu.pk, sameenathar@yahoo.com

Abstract- In recent years immense growth of data i.e. big data is observed resulting in a brighter and more optimized future. Big Data demands large computational infrastructure with high performance processing capabilities. Preparing big data for mining and analysis is a challenging task and requires data to be preprocessed in order to improve quality of raw data. The data instance representation and quality is foremost. Data preprocessing is preliminary data mining practice in which raw data is transformed into a format suitable for another processing procedure. Data preprocessing improves the data quality by cleaning, normalizing, transforming and extracting relevant feature from raw data. Data preprocessing significantly improve the performance of machine learning algorithms which in turn leads to accurate data mining. Knowledge discovery from noisy, irrelevant and redundant data is difficult task therefore precise identification of extreme values and outlier, filling up missing values poses challenges. This paper discusses various big data pre-processing techniques in order to prepare it for mining and analysis tasks.

Keywords- Big Data, Data Pre-processing, Data mining, Data preparation, Text Pre-processing, tariffs
Scientific Applications of Forensic Science for Detection of Criminals & different Diseases Using Optical Biosensor

Sowmya Padukone.G and Uma Devi.H

THE OXFORD COLLEGE OF ENGINEERING, INDIA,  
Dr.Ambedkar Institute of Technology, India

sowmyapk121@gmail.com, umadeviait@gmail.com

Abstract- The Sequencing of DNA is always different from one human being to another. There will be many proofs available at the spot where Crime has occurred. At the spot, many evidences may be available like Hair, Blood, Semen, Finger Prints etc. From the Crime Spot Suspects DNA Profile will be Collected. If this matches with the Evidence DNA Profile, then the Crime Investigation becomes very easier by Using Forensic Analysis. For this, Proper analysis has to be done. Here we are analyzing Quality Factor of DNA Profile of the evident by using OptiFDTD. The analysis is done by using Simulation Process graphically.

Keywords- DNA Profile, Crime, Forensic, Finger Prints.
Series solution of fractional Pantograph equations via Taylor series

1Amber Shaikh, 2Fozia Hanif, 3M. Sadiq Ali Khan, 4Asif Jamal and 5Hassan Khan

1National University of Computers and Emerging Sciences, Pakistan
2,3University of Karachi, Pakistan
4Federal Urdu University of Art And Science Technology & Department of Basic Science DHA Suffa University, Pakistan
5Behria University, Karachi, Pakistan

amber.shaikh@nu.edu.pk, ms_khans2011@hotmail.com, msakhan@uok.edu.pk, asifjamal46@yahoo.com, Hassan_khan94@hotmail.com

Abstract- This article is devoted to develop a numerical approximation called Taylor minimization method for initial and boundary value fractional Pantograph equations, which governs the modeling of train system, with neutral and multi term delays. Taylor optimization technique is basically composed of truncated Taylor series approximation of unknown function while employment of procedure is accompanied by an optimization strategy that is simulated annealing for carrying out the learning phase of unknown Taylor series coefficients. Proposed technique is implemented on various models of Pantograph equations to study the applicability and effectiveness of the planned scheme while error analysis and comparison with previous methods are performed to validate the results. To measure the capability of convergence the data for 100 numbers of independent runs is demonstrated in form of pictorial presentation.

Keywords-Taylor series, fractional Pantograph equation simulated annealing, proportional delays
Controlling the Altitude Dynamics of Quadcopter using Robust Output Feedback Controller

Bushra Shaikh, Arbab Nighat and Bhawani Shankar Chowdhry

Mehran University of Engineering and Technology, Pakistan

bushra.shaikh08@hotmail.com, arbab.nighat@faculty.muet.edu.pk, bsc_itman@yahoo.com

Abstract- This paper deals with observer based controlling and stabilization of the nonlinear dynamics of the quadcopter and in order to explore the complex dynamics of quadcopter, only altitude of the quadcopter is considered. Nonlinear model of the altitude is extracted from the six DOF model of the quadcopter and the same is linearized. Robust controller is implemented in the design to cater with nonlinear nature of the quadcopter at hover by using both Sliding mode control and model predictive controller. The soft instrument, observer, is designed here for the state estimation purpose to bring the simulated system more closely to realistic values. Effectiveness of the designed system is ensured by trajectory tracking of the quadcopter. Simulation results presented show that output feedback based controller designed having advantageous superior performance as compared to only conventional controllers designed.

Keywords- observer, output feedback controller, altitude SMC, MPC.
Analyzing Students' Academic Performance through Educational Data Mining

Sana Fatima, Dr. Isma Farah Siddiqui and Dr. Qasim Arain

Mehran University of Engineering and Technology, Pakistan

sanabhutto163@hotmail.com, isma.farah@faculty.muet.edu.pk, qasim.arain@faculty.muet.edu.pk

Abstract- Predicting students' performance is a very important task in any educational system. Therefore, to predict the learner's behavior towards studies many data mining techniques are used like clustering, classification, regression. In this paper, new student's performance prediction model and new features are introduced that have a great influence on student's academic achievement i.e. student absence days in class and parents' involvement in the learning process. In this paper, considerable attention is on the punctuality of students and the effect of participation of parents in the learning process. This category of features is concerned with the learner's interaction with the e-learning management system. Three different classifiers such as Naive Bayes, Decision Tree, and Artificial Neural Network are used to examine the effect of these features on students' educational performance. The accuracy of the proposed model achieved up to 10% to 15% and is much improved as compared to the results when such features are removed.

Keywords- Educational data mining, students' performance prediction model, artificial neural network.
The Implementation of M-Commerce in Supply Chain Management System

1Yousef A.Baker El-Ebiary, 2Najeeb Abas Al-Sammarraie and 3Syarilla Iryani A. Saany

1Faculty of Informatics and Computing, UniSZA, Malaysia
2Faculty of Computer and Information Technology, MEDIU, Malaysia
3Faculty of Informatics and Computing, UniSZA, Malaysia

yousefelebiary@unisza.edu.my, dr.Najeeb@mediu.edu.my, syarilla@unisza.edu.my

Abstract- The progression of wireless technologies will dramatically and fundamentally transform the supply chain management, through the imminent mobile revolution. Many aspects of organizational life will be impacted by the revolution. Firstly, the crucial data will be presented in real time to help the decision makers while the ways businesses communicate, and the relationships with consumers and suppliers will dramatically change, all of which, will transform how the supply chain is managed. Issues related to the integration of Mobile Commerce (M-Commerce) and Supply Chain Management (SCM) including the dearth of killer applications, mobile device limits, networking issues, infrastructure restrictions, security matters, and user distrust in mobile applications, are examined in this paper. There are also highlights on issues including usability, user interfaces, mobile access to databases, agent technologies, and models of mobile business.

Keywords- Supply Chain Management (SCM), Information Systems (IS), E-Commerce, M-Commerce, Mobile Commerce Wireless Technology.
For any queries, Write us: gyancity@gyancity.com abhishekmth97@gmail.com