The background of the entire image is a blue-toned circuit board pattern. In the center, a large, stylized, light blue letter 'E' is superimposed. A hand with a finger pointing upwards is positioned in front of the 'E', with the fingertip touching the top bar of the letter. The hand and finger are rendered in a realistic, slightly blurred style.

**7TH IEEE INTERNATIONAL CONFERENCE
ON ENGINEERING TECHNOLOGIES AND
APPLIED SCIENCES**

ICETAS 2020

**18 - 20 DECEMBER 2020
KUALA LUMPUR, MALAYSIA**

7th IEEE International Conference on Engineering, Technologies and Applied Sciences 2020

2020 7th IEEE ICETAS is being technically supported by the IEEE IIUM SB Malaysia and IMS Chapter Malaysia. ICETAS will provide a meeting place for the sharing of novel ideas and research findings in the field of engineering, technologies, Applied sciences. The theme of this conference is “Engineering, Technologies & Applications of Applied Sciences are Driving our Future”.

Organized by:



Co-organizers



FACULTY OF
ENGINEERING



ABOUT ETSSM Sdn Bhd



Aims and Objectives:

The main aim of the ETSSM Sdn Bhd is to support research culture among international community in the fields of Engineering, Technologies, Business, Social and Applied Sciences.

The primary objective of the ETSSM Sdn Bhd is to promote research and developmental activities in Engineering, Technologies, Business, Social and Applied Sciences. Also, ETSSM Sdn Bhd is to promote information exchange between researchers, developers, industrialists, engineers, students, entrepreneurs and practitioners working in and around the world.

Activities:

The ETSSM Sdn Bhd is involved in organizing local as well as international level conferences, seminars, workshops, project competitions, project exhibitions, research talks and many more. The NQ-tech management and services intends to start research journals in multidisciplinary discipline covering major fields of Engineering, Technologies, Business, Social and Applied Sciences.

Prof. Dr. Asadullah Shah
Executive Chair ICETAS
2020
Director
ETSSM Sdn Bhd, Malaysia



FOREWORD FROM GENERAL CHAIR

Dear Colleagues,



It gives me great pleasure to welcome all of you in 7th IEEE International Conference on Engineering, Technologies & Applied Sciences 2020 (ICETAS 2020). The 7th IEEE ICETAS-2020 will provide a meeting place for the sharing of novel ideas and research findings in the field of engineering, technologies & applied sciences. Its main goal is to foster multidisciplinary exchange by researchers and developers as well as research students and professional experts. We invite original and unpublished work by Academics, Researchers, Business Leaders, Experts and Executives from Universities and industrial research institutes to submit for the conference.

The aim of the 7th IEEE ICETAS 2020 is to provide a platform for professionals to share their experiences, research studies and explore innovative solutions through joint research, to contribute to the advancement in engineering, technologies and applied sciences. I hope that this conference will be helpful in developing and sharing the strategies for meeting the challenges in Engineering, Technologies and Applied Sciences.

There is no doubt that the caliber and experience of our invited distinguish high-level speakers will inspire our wide participation and makes this conference a genuine platform to discuss matters involving the connection between idea creation and wealth creation.

Once again, we are delighted to welcome all of you in the 7th IEEE ICETAS 2020 conference and hope that it will be a productive, stimulating and successful event.

Dr. Syed Faiz Ahmed
General Chair
ICETAS 2020

FOREWORD TECHNICAL GENERAL CHAIR



The International Conference on Engineering, Technologies and Applied Sciences (ICETAS) 2020 is an IEEE Indexed Explore (Code #51660, ISBN No. 978-0-7381-0504-8) event with much more adding on to its début since its last debut in 2016. Here participants meet for an eye-to-eye and contemplating on different subject areas. ICETAS is one of the two flagship events of Engineering Technologies and Applied Sciences. ETSSM Sdn Bhd a platform where researchers, academicians and educationists from around the world meet once every year. ICETAS's Technical Committee adds values and virtues to their skills they have gained during such events in the past while attending to delegates' responses and queries diligently. Participation in our event will equip one with an unforgettable learning experience, as we are on our way to host more international events bearing flag of the major IEEE Societies. We hope that you will be having a fruitful stay here at Kuala Lumpur, Malaysia. We guarantee attention with service, and see you in the upcoming events which will be announced soon.

Dr. Sheroz Khan
Technical General Chair
ICETAS 2020



ORGANIZING COMMITTEE

Executive Chair
Prof. Dr. Asadullah Shah
General Chair
Dr. Syed Faiz Ahmed, Dr. Sheroz Khan (Technical)
Conference Coordinator / Secretary
Dr. Muhammad Yaqoob Koondhar
Technical Program Chair
Mr. Athar Ali (University of Trento, Italy)

Management Committee
Dr. Ali Raza Rang 95078621, IEEE IIUM SB65011 Chair
Dr. Muhamad Sahlan, Universitas Indonesia
Dr. Faraz Sheikh, International Islamic University Malaysia
Muhammad Shadab Khan, International Islamic University Malaysia
Abdul Salam Shah, University Kuala Lumpur
Imtiaz Ali Brohi, ILMA University, Karachi, Pakistan
Najma Imtiaz Ali, University of Sindh, Jamshoro, Pakistan
Advisory Committee
Dr. George Banky, Swinburne University of Technology, Australia
Dr. Muhamad Sahlan, Universitas Indonesia
Dr. Tehmina Karamat, Foundation University Islamabad Pakistan
Dr. Muhammad Islam, HoD Dept. of Electrical Engineering, OC, Onaizah, Saudi Arabia 2053
Dr. Ashraf Khalil, Department of EE Engineering, Universiti Teknologi Brunei
Dr. Nabil A. Ahmed, Electrical Engineering Department, College of Technological Studies,
Faraz Hassan, Massey University New Zealand
Prof. Dr. Badri Abu Bakar, University Kuala Lumpur, British Malaysian Institute
Syed Asad Ali Zaidi, Harbin Engineering University China
Naveed Anwar, Asian Institute of Technology, Thailand
Dr. Obed Rashid Syed, IBA Sukkur, University, Pakistan
Inayatullah Shah, International Islamic University Malaysia
Dr. Sumbul Arslan Khowaja, SZABIST University, Pakistan
Dr. Irfan Shaikh, University of Sindh, Jamshoro
Dr. Mohammad Kamrul Hasan, Faculty of Information Science & Technology, UKM,
Prof. Dr. Shayla Islam, UCSI University, Malaysia
Dr. Zuradzman Bin M. Rzalan, UniMAP
Dr. Kamran Karim Bux, Khalifa University, Qatar
Dr. Dur Mohammad Somroo, Universiti Tun Hussein Onn Malaysia
Dr. Jawad Shah, Universiti Kuala Lumpur

KEYNOTE SPEAKERS

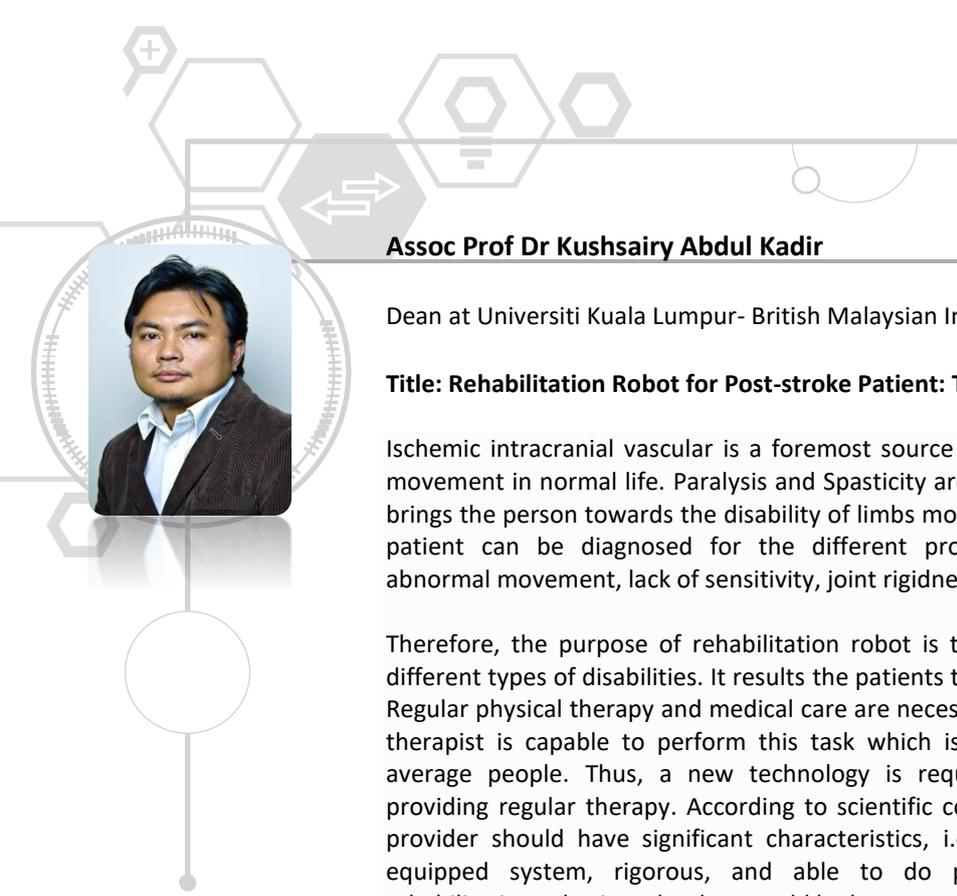
Professor Dr. Mohamed Ridza bin Wahiddin

Vice-Chancellor Universiti Sains Islam Malaysia (USIM), Malaysia

Title: Dissipative dynamics of an atom beyond the rotating-wave approximation

Abstract: We show that the inclusion of the counter-rotating terms to the interaction of a two-level atom with a thermal vacuum field results in fluorescence and absorption spectra which are qualitatively different to those that are obtained under the rotating-wave approximation. The effect of counter-rotating terms on the structure of the fluorescence and absorption spectra of a two-level atom is investigated. It is found that the inclusion of the counter-rotating terms in the interaction of the atom with the vacuum field can modify the spontaneous decay properties of the atom, and thereby gives rise to interesting new features in the spectra of the emitted field. An interpretation of the unusual features of the spectra is provided in terms of the transmission of a weak probe used to obtain quantitative information about the presence of two channels.





Assoc Prof Dr Kushsairy Abdul Kadir

Dean at Universiti Kuala Lumpur- British Malaysian Institute (UniKL-BMI), Malaysia

Title: Rehabilitation Robot for Post-stroke Patient: Technology, Product, and Challenges



Ischemic intracranial vascular is a foremost source of stroke that may results incapable of movement in normal life. Paralysis and Spasticity are mainly common effect of stroke which brings the person towards the disability of limbs movement by injured the brain. Post-stroke patient can be diagnosed for the different problems with muscle weakness/rigidity, abnormal movement, lack of sensitivity, joint rigidity, and orientation abnormality.

Therefore, the purpose of rehabilitation robot is to recover the post-stroke patient from different types of disabilities. It results the patients to become independent in their daily life. Regular physical therapy and medical care are necessary for a post-stroke patient. A physical therapist is capable to perform this task which is costly for regular basis treatment for average people. Thus, a new technology is required for post-stroke rehabilitation by providing regular therapy. According to scientific concern, the main efficient rehabilitation provider should have significant characteristics, i.e., perform specific task, multi-sensors equipped system, rigorous, and able to do precise therapy training. Accordingly, rehabilitation robotic technology could be best match for post-stroke rehabilitation therapy.

There are two kinds of robotics devices are currently available in the market for upper and lower limb rehabilitation. Reinstating the functionality of lower and upper limb will be the main goal of such kind of robotics devices. Rehabilitation robotic device plays important roles on the restoration of normal gait of post-stroke patient. There are almost fifteen robotics devices are commercially available for lower limb rehabilitation. However upper limbs robotics devices are commonly available in the current market. However, the available technology requires concurrent update. Therefore, in current decade, researchers are recurrently developing rehabilitation devices but still a lot of challenges need to be sorted out. Challenges include traditional technology, heavy and rigid mechanical structure and human ergonomics and natural mechanism. Therefore, an intensive research is required to develop lower and upper limb rehabilitation robot by considering all said issues.

In this research, we are trying to sort-out the current issues on the available technology, and rehabilitation robotic devices by doing an intensive research on current market. The result from this survey will help the researchers in their future development on rehabilitation robots.



Assoc Prof Robiah Ahmad, PhD

Department of Engineering and Technology, Universiti Teknologi Malaysia (UTM), Malaysia

Title: Thermal and Electronics Cooling Applications using Engineering Design Optimization Methods



The unprecedented growth in electronics, communication, and computing technologies for the last few decades along with their devices through miniaturization and an enhanced rate of operation and storage of data has brought about problems in the thermal management of these devices. Many heat removal techniques have been previously used to perform the heat dissipation process based on the concept of microelectronic mechanical systems (MEMS). In the past, the performance of these systems was evaluated using experimental and theoretical approaches. Theoretical solutions provided exact answers but were rarely available for three-dimensional multi-mode heat transfer problems. Experimental approaches were used to establish a general understanding of the behavior of a system but there they were difficult to measure as well as being expensive, particularly for parametric studies. Simulation and modelling is one of the tools that play a role in early product development stages which can help lower production cost, reduce time consumption, lower failure risk and more. Simulation with engineering optimization uses various optimization techniques to achieve design goals in different engineering applications. In this talk, the author will share some engineering design optimization approaches from different research projects for thermal cooling applications such as microchannel heat sink, thermal acoustic refrigeration as well as a magnetic piezoelectric fan for electronic cooling.

TENTATIVE CONFERENCE SCHEDULE

Schedule DAY-1: Friday 18th December 2020

Time	Venue	Program	Duration
11:00	OS-A	welcome speech by Conference Executive Chair Professor Dr. Asadullah Shah	10 minutes
11:10		Brief speech on conference statistics by the General Chair Associate Professor Dr. Syed Faiz Ahmed	10 minutes
Keynote Speech			
11:20	OS-A	Professor Dr Mohamed Ridza Wahiddin	20 minutes
11:40		Professor Dr Kushsairy Abdul Kadir	20 minutes
12:00		Professor Dr Robiah Ahmed	20 minutes
12:20		Vote of Thanks by Dr Yaqoob Koondhar Secretary ICETAS 2020	15 minutes
12:30		Break	90 minutes
14:00	OS-A.1	IT and Software	(10 min of presentations + 5 min of Q&A)
	OS-A.2	Engineering	
	OS-A.3	Engineering Technology	
15:30		Break	30 minutes
16:00	OS-A.4	IT and Software	(10 min of presentations + 5 min of Q&A)
	OS-A.5	Engineering	
	OS-A.6	Engineering Technology	
17:30 END of Day 1			

Schedule DAY-2: Saturday 19th December 2020

Time	Venue	Program	Duration
11:00	OS-B.1	IT and Software	(10 min of presentations + 5 min of Q&A)
	OS-B.2	Engineering	
	OS-B.3	Engineering Technology	
12:30		Refreshment Break	30 minutes
13:00	OS-B.4	IT and Software	(10 min of presentations + 5 min of Q&A)
	OS-B.5	Engineering	
	OS-B.6	Engineering Technology	
14:30		Break	30 minutes
15:00	OS-B.7	IT and Software	(10 min of presentations + 5 min of Q&A)
	OS-B.8	Engineering	
	OS-B.9	Engineering Technology	
16:30	OS-B.10	Closing Ceremony (Closing Remarks by Professor Sheraz Khan)	
End of Conference			

TECHNICAL SESSIONS: SCHEDULE

DAY-1: Friday 18th December 2020

Parallel Session 1		
IT and Software (Online Session-A.1)		
TIME(Hrs)	PAPER ID	PAPER TITLE
14:00	1	Stakeholder's Training Process for GSD Based Requirements Elicitation Frameworks
14:15	2	Pre-elicitation Processes Hierarchy for GSD Based Requirements Elicitation Frameworks
14:30	3	Decentralized Open Banking Using Hyperledger Fabric
14:45	4	A Hyperledger Fabric Based Organizational Decentralized Access Control Solution
15:00	5	Requirements and features of remote monitoring assistance for psychiatric patient in hospital
15:15	18	Homomorphic Encryption for Cloud Computing and Its Challenges
Engineering (Online Session-A.2)		
TIME(Hrs)	PAPER ID	PAPER TITLE
14:00	6	Unattended object detection and tracking
14:15	17	Early Severity Assessment of Unbalanced rotor Fault in WRIM using ANN based Hybrid TSA and FFT Approach
14:30	19	Impact on Power Quality of Photovoltaic Systems on Distribution Networks
14:45	20	The Effect of Interior Furnishing on Room Lighting Measurement: Wall and Object Colour
15:00	24	Multi-agent System for Decentralized Energy Management Approach in Collaborative Microgrids
15:15	27	Impact of Augmented Reality and Virtual Reality in the Transformation of Virtual Customer Relationship Management Sector
Engineering Technology (Online Session-A.3)		
TIME(Hrs)	PAPER ID	PAPER TITLE
14:00	11	Medical Image Analysis using Deep Learning: A Review
14:15	13	Home-based monitoring and alert system for Sleep Apnea patients
14:30	21	Rate-distortion modelling of low and high complex scalable video sequences
14:45	22	Posture Analysis of Students doing Online Class at Home during COVID-19 Pandemic
15:00	23	Ergonomic Assessment of Personal Protective Equipment for COVID-19 in the Philippines
15:15	35	Adaptive Channel Estimation and Equalization in Frequency Domain Based on Superimposed Pilot Technique for Vehicular OFDM Communications

DAY-1: Friday 18th December 2020

Parallel Session 2		
IT and Software (Online Session-A.4)		
TIME(Hrs)	PAPER ID	PAPER TITLE
16:00	25	Cooperative Device to Device Communications with Network Coding
16:15	26	IoT Based Secured Online Attendance Management System
16:30	28	Image classification with multi-scale convolutional sparse representation
16:45	30	Restructuring iCheating Model with Cluster Analysis on Affecting Factors of Academic Cheating Behavior
17:00	33	CONCEPTUAL FRAMEWORK FOR PERFORMANCE ANALYSIS OF TCP IMPLEMENTATION ON VARIOUS PLATFORMS
17:15	40	CONCEPTUAL FRAMEWORK FOR TRANSFORMATION OF CONVERGED INFRASTRUCTURE (CI) INTO HYPER CONVERGED TECHNOLOGY FOR VIRTUALIZATION OF SERVER INFRASTRUCTURE
Engineering (Online Session-A.5)		
TIME(Hrs)	PAPER ID	PAPER TITLE
16:00	29	Outdoor Position Estimation of a Mobile Platform for Precision Farming and Agriculture Automation
16:15	31	3D static analysis of homogenized piezoelectric plates based on the Mori-Tanaka and the Stroh approach
16:30	46	Design and Performance Analysis of a Slotted Microstrip Patch Antenna for Different GNSS Frequencies
16:45	48	Designing a Thermoelectric Generator for Industrial Flare Heat Recovery
17:00	49	Numerical Modelling of Air Driven High-Temperature Phase Change Material Energy Storage System
17:15	50	Dangerous Driving Prediction Model based on Long Short-term Memory Network with Dynamic Weighted Moving Average of Heart-Rate Variability
Engineering Technology (Online Session-A.6)		
TIME(Hrs)	PAPER ID	PAPER TITLE
16:00	36	A Model For the Adoption of Digital Marketing And Its Effect on the Competitiveness Among SMEs in Oman
16:15	37	Technological Factors That Affect Adoption of Digital Marketing Among SMEs In Oman
16:30	39	Adaptive Multiplexing Technique for Mobile Networks based on SNR
16:45	87	Proposed Capacity Improvement of the Logistics Management Division of the Department of Health of the Philippines
17:00	88	Shoplifting Prevention System for Fitting Rooms
17:15	94	Smart Assistance for Disables using Bluetooth and Arduino

DAY-2: Saturday 19th December 2020

Parallel Session 1		
IT and Software (Online Session-B.1)		
TIME(Hrs)	PAPER ID	PAPER TITLE
11:00	42	Hierarchy Assessment of ISO 50001 Implementation Effectiveness
11:15	45	Image Classification Using I1 -fidelity Multi-layer Convolutional Sparse Representation
11:30	59	Exploring the Perceptions of Faculty members and Students on Cloud Computing Adoption in Higher Educational Institutions of Bangladesh
11:45	60	Religious Tourism Safety Recommendation System: A Case Study of Religious Sites in Nepal
12:00	61	Digital Literacy of Educators and their Attitude Towards MOOC Platform in Arab World
12:15	62	Foreign Arrival Prediction in Indonesia after Pandemic Based On Google Trends Analytics
Engineering (Online Session-B.2)		
TIME(Hrs)	PAPER ID	PAPER TITLE
11:00	52	FPGA in the loop implementation of an adaptive-filtering based control of shunt active power filter
11:15	54	Most Efficient Perovskite Precursors Molarity for Perovskite Solar Cell
11:30	57	RFID based Security and Home Automation System using FPGA
11:45	65	Watercraft-Net: A Deep Inference Vision Approach of Watercraft Detection for Maritime Surveillance System Using Optical Aerial Images
12:00	66	Eye-Smoker: A Machine Vision-Based Nose Inference System of Cigarette Smoking Detection using Convolutional Neural Network
12:15	67	A Machine Vision-Based Deep Learning Inference Approach of Biker Safety Hat Detection System
Engineering Technology (Online Session-B.3)		
TIME(Hrs)	PAPER ID	PAPER TITLE
11:00	86	Impacts of ICT and innovation on economic growth in advanced countries
11:15	89	Natural Language Processing based Question Answering Techniques: A Survey
11:30	90	Cobot Fleet Management System Using Cloud and Edge Computing
11:45	91	An Operational View into Docker Registry with Scalability, Access Control and Image Assessment
12:00	92	Development of a web portal 'IKIGAI' to assess the psychological well-being of university students
12:15	95	Exploring the use of Digital Storytelling in Students' Motivation to learn Seerah (History of the Prophets) subject

DAY-2: Saturday 19th December 2020

Parallel Session 2		
IT and Software (Online Session-B.4)		
TIME(Hrs)	PAPER ID	PAPER TITLE
13:00	63	ProgMath: Enlighten Math and Programming Logics
13:15	64	The Book Stack: A Free Books and Class Notes Lending Application
13:30	71	Implementation of Computer-Based Information System on Rice Retailing Business using MS Access
13:45	72	Automatic Sinhala News Classification Approach for News Platforms
14:00	73	ArtFora: Phone Application for Artists and Clients
14:15	76	Improving the Current System of Online Sellers by Creating Database System using MS Assess
Engineering (Online Session-B.5)		
TIME(Hrs)	PAPER ID	PAPER TITLE
13:00	68	Cap-Eye-citor: A Machine Vision Inference Approach of Capacitor Detection for PCB Automatic Optical Inspection
13:15	69	Eye-Zheimer: A Deep Transfer Learning Approach of Dementia Detection and Classification from NeuroImaging
13:30	74	Deep-Hart: An Inference Deep Learning Approach of Hard Hat Detection for Work Safety and Surveillance
13:45	75	PET-Bottle-Recognizer: A Machine Vision Recognition of Polyethylene-Terephthalate Based- Bottle for Plastic Waste Classification and Recycling
14:00	84	Car Park Reservation Using QR System: A Proposed Flow
14:15	96	Study of Parametric Effects due to Mutual Coupling using High Permittivity Dielectric-Director in Planar Array Configuration
Engineering Technology (Online Session-B.6)		
TIME(Hrs)	PAPER ID	PAPER TITLE
13:00	97	Effect of Mach number and Level of Expansion on Flow Development at Different Lengths of Ducts with Sudden Expansion
13:15	98	Effect of NPR on the Flow Pattern of Circular Pipe at High Mach Numbers
13:30	99	Experimental Investigation on Nozzle Flow at Different Levels of Jet State at Supersonic Mach Numbers with Sudden Expansion
13:45	101	Studies on the Nozzle Flow and the Flow Pattern with Abrupt Increase in Area
14:00	103	Studies on Nozzle Flow at Beneficial and Adverse Flow Conditions and Effectiveness of Flow Control Management
14:15	102	Waste Monitoring and Reporting System for Community Health Center in Depok, Indonesia

DAY-2: Saturday 19th December 2020

Parallel Session 3		
IT and Software (Online Session-B.7)		
TIME(Hrs)	PAPER ID	PAPER TITLE
15:00	77	Improving Customer Experience on Instagram: Online Food Shop Ordering
15:15	79	Seiton: A Mobile Inventory Management System Application for Micro, Small and Medium-sized Enterprise
15:30	81	Digital Library Database and Distributed Information: A Case Study in Mapúa University
15:45	82	Implementing an automated Online Job Finder system in the Philippines using MS Access
16:00	83	Designing an Inventory Database Software Suitable for Small Business: A Case Study
16:15	85	Improving and Redesigning the Online Complaint System of the National Bureau of Investigation (NBI)
Engineering (Online Session-B.8)		
TIME(Hrs)	PAPER ID	PAPER TITLE
15:00	80	Early Warning Detection System Architecture for COVID-19 via Wastewater
15:15	104	A comparative analysis of photovoltaic solar and geothermal heating and cooling systems
15:30	105	Optimal decentralized energy management of a smart home based on energy democracy
15:45	14	Security Health Assessment of Public WIFI Environments in the UAE
16:00	16	Big Data Security and Privacy Implementation: The way Ahead
16:15	7	Black/Gray Holes Detection Tools in MANET: comparison and analysis
Engineering Technology (Online Session-B.9)		
TIME(Hrs)	PAPER ID	PAPER TITLE
15:00	44	DNS attack mitigation Using OpenStack Isolation
15:15	56	Design and Development of Assistive Robotic System for Covid-19
15:30	58	Using SMART sensors and Building Management System to improve the Performance and Productivity for Commercial Buildings
15:45	70	Muscle Fatigue Detection and Analysis Using EMG Sensor
16:00		
16:15		

Paper ID: 1

Stakeholder's Training Process for GSD Based Requirements Elicitation Frameworks

M. Aqeel Iqbal, Asadullah Shah, Ammar F. A. and Adel Rashed Aldaihani

The requirements elicitation frameworks define a systematic way of performing requirements elicitation tasks at pre-stages of the requirements engineering process. The requirements elicitation is a human-centered activity which critically depends upon the selection and training of the most appropriate stakeholders. The requirements elicitation process becomes challenging in global software development projects where stakeholders of the requirements elicitation process have high diversities in their geographical location, working time zones and local cultures. In such global software development scenarios, the need for the trainings of the involved stakeholders becomes most important aspect to create smoothness in the working setups. This article presents a stakeholder's training process for global software development-based requirements elicitation frameworks to address the emergent need in software development industry. The proposed stakeholder's training process provides a mechanism to comprehensively train requirements elicitation stakeholder's about situational context and global software development context. The application of the proposed stakeholder's training process in software development projects highlighted a significant improvement in the quality of the whole requirements elicitation process for global software development projects.

Paper ID: 2

Pre-elicitation Processes Hierarchy for GSD Based Requirements Elicitation Frameworks

M. Aqeel Iqbal, Asadullah Shah, Ammar F. A. and Adel Rashed Aldaihani

The requirements elicitation is considered as one of the most critical tasks performed during the whole requirements engineering process. The requirements elicitation frameworks define a systematic structured way to perform requirements elicitation task during software development projects. The requirements elicitation in global software development projects becomes a more challenging task due to the high diversity in its participants. The pre-elicitation processes can be customized to better plane the requirements elicitation process for global software development contexts. This article presents a structured hierarchy of pre-elicitation processes for global software development-based requirements elicitation frameworks. The presented pre-elicitation processes hierarchy can be customized to apply for traditional requirements elicitation frameworks used for inhouse software development contexts.

Paper ID: 3

Decentralized Open Banking Using Hyperledger Fabric

Sangat Das, Chinmay Saraf and Devashish Khairnar

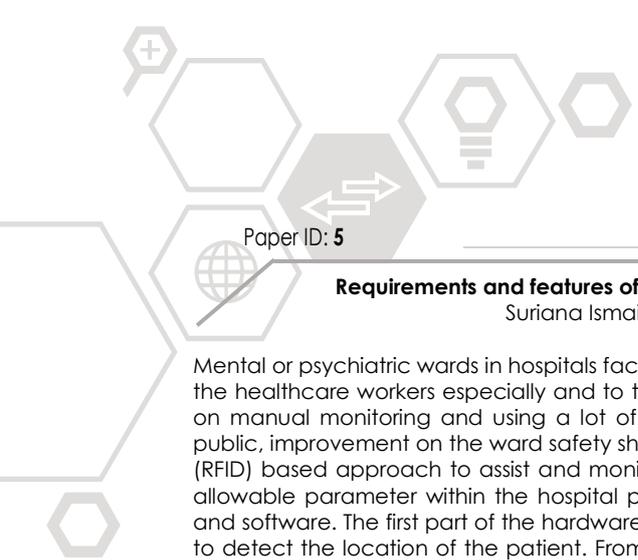
Introduction of Open Banking by the European Union from January 2018 is considered as important as the introduction of credit cards. Open Banking is a standard under which banks share customer's data through secure APIs with the consent of respective customers so that customers can manage their wealth effectively. Currently, many FinTechs are providing services to customers with the help of APIs provided by an individual bank. But, these Fintechs are based on the centralized implementation of the application, which makes the system and eventually customer's data vulnerable for a cyber attack. To address this problem, we are proposing a blockchain-based decentralized application solution for the implementation of open banking APIs. In the proposed solution, Hyperledger Fabric is used to provide a secure and decentralized medium to share data between Banks and FinTechs. By introducing the new layer in the current implementations of open banking, we can achieve more security, resiliency, and data availability. The proposed application will provide a better user experience without compromising security. In the presented paper, we provided a prototype that combines the benefits of blockchain and open banking framework.

Paper ID: 4

A Hyperledger Fabric Based Organizational Decentralized Access Control Solution

Sangat Das, Chinmay Saraf and Devashish Khairnar

Currently, various organizations rely on third-party access control and resource management applications or develop their centralized application for resource management. Considering the pitfalls of present centralized applications, the proposed solution presents a decentralized approach towards organizational resource management and access control provisioning within or across organizational units. The research attempts to provide solutions for problems and risks associated with a centralized resource and access control management systems. This approach leverages the advantages of the permissioned Blockchain framework - Hyperledger Fabric and peer-to-peer network. The proposed solution also provides Single Sign-On authentication mechanism (SSO) for various organizational resources. Using the approach presented in the paper we can develop an efficient way of Team management with which we can achieve a higher degree of autonomy of subdivisions within an organization.



Paper ID: 5

Requirements and features of remote monitoring assistance for psychiatric patient in hospital

Suriana Ismail, Roslan Ismail and Ahmad Hafidzi Fahrul Radzi

Mental or psychiatric wards in hospitals face the problems of handling high risk patient and this has alarming concern to the healthcare workers especially and to the public generally. Currently the monitoring of this special ward are mainly on manual monitoring and using a lot of man power resources. Due to the safety of the healthcare personal and public, improvement on the ward safety should be prioritized. In this paper, we propose a radio frequency identification (RFID) based approach to assist and monitor the mental patients. This is to ensure the patients are in safe location or allowable parameter within the hospital premise. The propose method involves two major components of hardware and software. The first part of the hardware system, consist of a microcontroller integrate with an electronic component to detect the location of the patient. From the software system aspect, a web application will be integrated with the patient location history record real-time for monitoring activity by the healthcare staff. By adopting this approach, it can improve the safety of the wards and allow more time for the healthcare to give special attention to the patients as they are no longer need to be worry of the location of the patients.

Paper ID: 6

Unattended object detection and tracking

Piyanut Pantongdee, Mingmanas Sivaraksa and Thanadol Pritranan

This paper proposes a design of smart surveillance system that can detect unattended objects and tracking owner of object upon the successful implementation, it can decrease the workload of security staff. Developing system is implemented by using image processing techniques alone with machine learning. In the event of an unattended object being detected, the system will alert the responsible person and display tracking the owner of the object. The system consists of four major steps: 1.) Image Acquisition 2.) Image Detection 3.) Event Recognition 4.) Result Visualization. The experiment is conducted in order to measure the accuracy of each process in the system. This system uses two datasets which is PETS 2006 and self generated datasets. Finally, the correctness of the background subtraction process is 89.55%, the correctness of the tracking process is 87.76%, and overall correctness of the system is 78.54%.

Paper ID: 7

Black/Gray Holes Detection Tools in MANET: comparison and analysis

Mohammed Salah Abood, Hussain Mahdi, Mustafa Hamdi, Omar Jamal Ibrahim, Ruaa Qahtan Mohammed and Syed Faiz Ahmed

A wide community of sensor nodes is subscribing to the Mobile AdHoc network (MANET) and has self-directed commands. Individual nodes within the network can escort or without permission or prior warning. Therefore the MANET becomes widely applied in vital domains due to its dynamic and autonomous feature and its ease of installation. However, MANET is target to malicious attacks. One of these attacks is coming from what is called black hole and gray holes nodes. Many published work addressed the detection mechanism developed for black holes. However, not a lot of attention was given for the analytic comparison with gray hole. This work introduces, compares and analyzes the most recent researches that addressed the development of gray holes as well as black holes identification tools. In this paper, we presented a comparative table of the most relevant papers, with an indication of the benefits and gaps for each of the protocol used and the approach or technique implemented by the researchers. Then, we presented a summary the best papers that received a high rating. And presented subsequently our vision and recommendations to inspire and motivate researchers to work on these observations in the future.

Paper ID: 10

An Empirical Study for E-commerce Adoption by SMEs in Algeria

Houache Hassen, Noor Hayani Binti Abd Rahima, Asadullah Shah and Anwar Hasan Abdullah Othman

Small and Medium-sized Enterprises (SMEs) are regarded as the backbone of the growth of the world economy. They had recently experienced rapid growth and improved their business activities in terms of customer numbers and revenue expansion when they began using e-commerce in their business. However, the adoption of e-commerce in developing countries by SMEs is low due to several factors, including the lack of a fit model for the adoption of e-commerce. Therefore, some of the most widely used models for the adoption of e-commerce in developing countries were highlighted. Then, the conceptual model was developed through the models and theories which are among the most frequently applied theoretical models on the adoption of e-commerce in developing countries. These models are Unified Theory of Acceptance and Use of Technology (UTAUT), Technology Organisation Environment (TOE), and Perceived eReadiness Model (PERM). This research uses the quantitative research method, where a survey responded



by 315 SMEs in Algeria. The research hypotheses were examined, and the proposed research model was validated through Structural Equation Modelling (SEM) using AMOS software. The main findings of the present study comprise some key factors that have a significant effect on e-commerce adoption which are competitive pressure, delivery systems, necessary guidance and assistance, buying habits, enterprise financial resource, human resources, and trust in the state system and IT skills. The significant effects were mediated by three variables which are awareness, fear of risk in e-commerce, and the intention to adopt e-commerce. At the same time, there are three non-significant factors which are government e-readiness, bank e-readiness and technology resources. The factors identified in the results are essential components of the adoption of e-commerce by SMEs. The developed model would be the model for e-commerce adoption by Algerian SMEs as it given a clear view of e-commerce practices to SMEs' leaders and it elucidates the critical factors and variables to consider when implementing an e-commerce system.

Paper ID: 11

Medical Image Analysis using Deep Learning: A Review

Syed Qamrun Nisa and Mohammad Shadab Khan

Over the recent past, deep learning is one of the core research directions which has gained a great deal of attention due to its outstanding performance in the area of medical image analysis. This paper aims to present a review of deep learning concepts related to medical imaging. We examine the use of deep learning for medical image analysis including segmentation, object detection and classification. Deep learning techniques including convolutional neural networks (CNNs), recurrent neural network (RNNs) and auto-encoder (AE) are also discussed in this paper.

Paper ID: 13

Home-based monitoring and alert system for Sleep Apnea patients

Mohamed Feroz Mohamed Iqbal and Yvonne Y H Lam

Obstructive Sleep Apnea (OSA) is a very common sleep disorder which affects a significant portion of the population. The gold standard for monitoring OSA, and the treatment efficacy is through a Polysomnogram (PSG). A PSG measures a multitude of biological signals to determine the severity of OSA. However, a PSG is expensive, and causes discomfort for the patients. The proposed system allows for home-based monitoring that is affordable and much more comfortable for the patient than the conventional PSG. It makes use of 3 biological signals including a single channel frontal electroencephalogram (EEG) from the FP2-A1 positions, blood oxygen saturation (SpO2) reading, and recording of snores. In the proposed system, every individual event is logged into a locally stored file, and if there are at least 2 OSA events happening at the same time, the OSA episode is deemed serious and a buzzer will sound to wake the patient. A message is also sent to the caregiver / next-of-kin to notify them.

Paper ID: 14

Security Health Assessment of Public WIFI Environments in the UAE

Leena Hammad and Modafar Ati

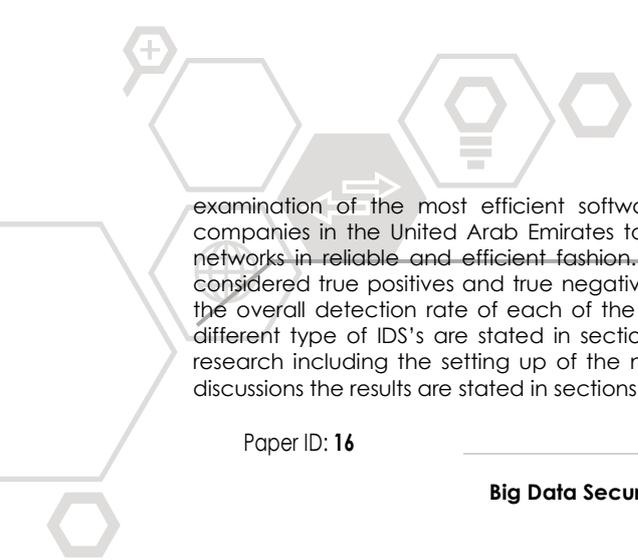
In recent years, a noticeable increase has been observed in cyber-attacks that target public networks WiFi. These attacks happen due to the vast use of smartphones and the large amount of data transferred over WiFi. The majority of users tend to trust free public wireless networks for performing different online activities include sending emails, using social media as well as performing online banking, without being aware of whether these wireless networks are safe or have been used as a platform by attackers to launch cyber-attacks. Networks usually implement Intrusion Detection Systems in order to detect any malicious activities. However, it is challenging to apply such a technique in a mobile environment. Hence, low interaction honeypots work as an effective and fast alternative to observe WiFi network threats using smartphones. When smartphones are equipped with honeypots is considered an advanced security monitoring and detection tool that provides the users with an early assessment for the network security health. This research focuses on evaluating the security health of the public WiFi environment using mobile devices. There are many free public WiFi networks available for users in different commercial facilities such as shopping malls, cafes, and airports where users can connect to the internet without any knowledge of environmental security. In this research, most of the vulnerabilities are highlighted and proper solutions were proposed, HosTaGe honeypot-To-Go is selected in this work to be installed and deployed in an Android smartphone, and to study its efficiency in assessing the security of public WiFi networks environment to provide a solution that reduces the vulnerability of the public network.

Paper ID: 15

Implementation of Multi IDS for Analyzing Different Levels Of Protections in Real Time Simulation

Hamad Al-Neyadi and Modafar Ati

With the ever increase of attacks on network resources in recent years made it essential to understand the pattern of such attacks. This, in turn, will enable researchers to find the appropriate approaches to protect such resources. The aim of this research is to examine the effectiveness of different types of intrusion detection systems that are available particularly Suricata and Snort. Both of these IDS's are tested in a simulated fictitious environment that will mimic a real cyber-attack. Results will be compared between them in order to recommend the most appropriate and effective intrusion detection systems in detecting the attacks. The significance to this research is that it will involve the



examination of the most efficient software in the market today that deal with network intrusion. Thus allowing companies in the United Arab Emirates to examine the recommendations of this research in the protection of their networks in reliable and efficient fashion. For the assessment of accuracy and efficiency, different parameters are considered true positives and true negatives alerts are closely investigated in order to obtain the accuracy and then the overall detection rate of each of the IDS's under investigation. The paper is divided to five sections; Introducing different type of IDS's are stated in section one. Section Two, however, describes the methodology adopted in this research including the setting up of the network and the training windows used. Implementation of all exploits and discussions the results are stated in sections three and four. Conclusion and further studies are shown in section five.

Paper ID: 16

Big Data Security and Privacy Implementation: The way Ahead

Modafar Ati

Due to the rapid advancement in ICT has made technology to become an essential necessity in most areas of life. The volume of information recorded in data warehouses in the past is starting to grow rapidly over time. Thus the condition of storing information has to change at the same rate in order to reflect such vast growth, and new opportunities for increasing its volume must evolve. The most actively topic by many global information technology companies is big data. At present and in the future as anticipated, one of the engines for the development of information technology is big data. It is due to the fact that a huge amount of information has begun to accumulate for all Internet users. With the advent of global computer networks, particularly the Internet, access to information has been greatly simplified, which has led to an increase in the threat of data security breaches in the absence of measures to protect them. The aim of this research is to investigate the approaches that can be adapted in order to secure such a vast amount of information that is accumulated from Big data. The paper is divided into five sections; including the introduction, issues associated with privacy and security, requirements for data privacy is also highlighted. The consequences of losing privacy are also described. Security problems and decisions are also presented and the conclusion summarizes our findings of the topics associated with big data security challenges.

Paper ID: 17

Early Severity Assessment of Unbalanced rotor Fault in WRIM using ANN based Hybrid TSA and FFT Approach

Hamza Sabir, Mohammed Ouassaid and Nabil Ngote

Nowadays, the wound rotor induction machines (WRIMs) are widely used in wind turbine installations. A small premature undetected unbalanced rotor fault subsequently provokes the rotor rubbing on stator due to the vibration produced by this imbalance of the rotor. This kind of breakdowns is sometimes very expensive. To tackle such a kind of failure, an early survey of any little unbalanced rotor at different load is necessary to prevent the machine breakdown and maintenance cost. This work propounds a novel technique to enhance the method of condition monitoring (CM) of the incipient unbalanced rotor defect in WRIMs which operate at diverse load conditions. The new proposed strategy based on the combination of the Time Synchronous Averaging (TSA), Fast Fourier Transform (FFT) and an Artificial Neural Network algorithm (ANN) is elaborated. As a matter of fact, a small unbalanced rotor defect cannot be observed immediately by supervising the stator line current, exceptionally in the case of a low load and a small fault, however, The residual stator current and the fault frequency are used both as input for an ANN algorithm to make an exact decision about rotor faults under distinct loads. The proposed supervising system has been built using MatLab R SIMULINK. The conceived strategy has been verified under a different defect level. The obtained results demonstrate that this approach is qualified to exactly assess a little unbalance in the rotor of the wound rotor machine even at different loads.

Paper ID: 18

Homomorphic Encryption for Cloud Computing and Its Challenges

Ruba Awadallah and Azman Samsudin

Cloud Computing has been envisioned as the next generation architecture for Information Technology enterprises. The Cloud Computing concept offers scalable resources provisioned as a service over the Internet. Economic benefits are the main driver for the Cloud Computing since it promises reduction of capital expenditure and operational expenditure. In order for this to become reality, however, there are still some challenges that need to be solved. Most important among these challenges are the security and trust issues, since the user's data has to be released to the Cloud and thus leaves the protection sphere of the data owner. Homomorphic Encryption is proposed to ensure data privacy, confidentiality, and integrity. Unlike traditional cryptosystem, Homomorphic Encryption allows computation delegation to the Cloud Service provider. However, there are significant security issues associated to the implementation of such scheme. The client (data owner) is unable to track the data once the data is being outsourced and by the same token, the client is also unable to authenticate the operations that are being applied to the encrypted data. This paper introduces a brief survey of cloud computing security issues and shows that Homomorphic Encryption alone is not adequate to provide indistinguishable ciphertext, under the adaptive chosen-ciphertext attacks. The paper concludes by providing possible suggestions as solution to the identified problem.

Paper ID: 19

Impact on Power Quality of Photovoltaic Systems on Distribution Networks

This paper presents a comprehensive power quality analysis of the impact of high penetration rates of photovoltaic generation on distribution networks. A PV generator with two-stage converter and the control system involved in generating the PWM switching signals is developed in an electromagnetic transient simulation program based on a PSCAD/EMTDC platform. The IEEE 34-node distribution feeder, which incorporates voltage regulators, is used to investigate the proliferation of PV systems on a distribution network. The effects on voltage profiles, voltage unbalance, harmonics, as well as on the operation of tap position on voltage regulators are analysed. Results indicate that reverse active and reactive power flows may appear at the transformer substation of the distribution feeder, whereas the power factor may change from lagging to leading. Further, harmonic injection and voltage unbalance remain below guidelines limits.

Paper ID: 20

The Effect of Interior Furnishing on Room Lighting Measurement: Wall and Object Colour
Azmir Ahmad, Nurul Syazwin Khudzir, Wan Ismahani Wan Mohamed and Ai-Hong Chen

Background: Colour is one of the factors that could affect the lighting condition and thus affecting human either visual or non-visual. It is important to investigate the effect of colours especially in the interior furnishing to understand the colour interaction in light measurements. Purpose: To investigate the effect of short, medium, and long wavelength surface colour on room lighting measurement. Materials & Methods: This study was carried out in 3.0m × 3.5m × 3.0m dark room. No natural light interference. Light measurements were obtained based on 30 predetermined location specific points. Short, medium, and long wavelength surface colour were manipulated under two different conditions (single wall and 50cm³ object). White and black were used as control comparison. There were two measurement planes: floor plane and 75cm above floor plane. A digital lux meter was used to measure the illuminance level of the room. The measurement was taken once on every point and the average measurement was analysed. Results: The effect of wall colour [One-way repeated ANOVA: $F = 0.92$, $p > 0.05$] and object colour [One-way repeated ANOVA: $F = 1.51$, $p > 0.05$] was not statistically significant. Conclusion: Both single wall colour change and object colour change did not affect the overall lighting measurement of the (3m×3.5m×3m) room size. Future research with different intensity of light sources and light types is recommended.

Paper ID: 21

Rate-distortion modelling of low and high complex scalable video sequences
Arslan Hassan and Maira Alvi

Rate-Distortion (R-D) models are applied in video processing techniques to predict the bit rate required for transmission of video sequences in the networks. Video coding techniques are utilized to smartly divide the bandwidth in the communication networks. This research presents Rate-Distortion models for low-complex and high-complex scalable video sequences. Base-Layer (BL) rate and Enhancement-Layer (EL) rate models are developed alongside with R-D models to get more precise rate predictions. Videos will be classified based on low and high complexity. This classification would be achieved by the Spatial-Index (SI) and Temporal-Index (TI) of each Group of Pictures (GOP) in video sequences. By using the role of SI and TI, an algorithm is developed to predict the rate required by video sequences of low and high complexity with the given distortion and vice versa. The experimental results have shown the productive comparison of presented R-D models and existing R-D models.

Paper ID: 22

Posture Analysis of Students doing Online Class at Home during COVID-19 Pandemic
Barbara Eliza Vallespin and Yogi Tri Prasetyo

The global pandemic on 2020 led most schools and universities to prepare and start adapting digital education by offering full online classes to students in the comfort of their homes – this situation is said to be one of the “new normal”. With this setup, question on whether there is a high vulnerability in students to postural risk and body discomfort became a concern. In this study we aim to assess whether said postural risk and body discomfort are apparent to students doing online classes in their respective home environment. Inputs of twenty-four (24) students were gathered from an online survey made, in which most of the questions were based from CMDQ questionnaire. Postural analysis was completed by using RULA and REBA. The study determined that the highest score from student participants were 7 in RULA and 5 in REBA and that posture risk level scores were of medium risk and necessary to be actioned. Findings were also found that CMDQ discomfort scores calculated in percentages were high to body parts such as lower back (15.37%), neck (13.29%), upper back (10.84%), and right wrist (9.25%). Overall, the study revealed that home environments of students' respondents are not yet ergonomically friendly and that postural risk and body discomfort are evident, too. This study highlights the need for students and parents/guardians' awareness on ergonomics at home to learn and apply in tackling the concern in postural risk and body discomfort, which is also an ongoing concern in school environment, that may cause risk to musculoskeletal conditions.

Paper ID: 23

Ergonomic Assessment of Personal Protective Equipment for COVID-19 in the Philippines
Ryuichi Kishimoto and Yogi Tri Prasetyo

Wearing of personal protective equipment during this health crisis as COVID-19 interrupts the living of the people from



different parts of the country. Having a PPE is a must since reopening of different businesses is on-going due to lockdown as implemented by the government. PPE should be worn by an individual as comfortable as they can. This paper will assess the comfortability rate of PPE used for COVID-19 using the likert scale. This will reveal how comfortable as an individual as they are going to wear his/her PPE based on their nature of work. From 30 respondents who accessed the online survey provided by the researcher and listed the PPE used for COVID-19. There are 30 respondents who accessed the online survey provided by the researcher. These individuals consists of 16 (53.3%) are students and individuals came from different nature of work in which 6 (20%) are education-based professionals, 2 (6.7%) are medical practitioner, 1 (3.3%) working on production based, 1 (3.3%) working as an accounting staff in hospital, 1 (3.3%) working in a company as sales representative, 1 (3.3%) as a senior administrative assistant and 1 (3.3%) as a customer associate. As a result of this study, it shows that there are individuals who experiences a very discomfort with their PPE. PPE should not only protect the individual but also it should be comfortable once they used it.

Paper ID: **24**

Multi-agent System for Decentralized Energy Management Approach in Collaborative Microgrids

Abdallah El Zerk, Ouassaid Mohammed and Zidani Youssef

Microgrids contain different nanogrids with various power capacities and fluctuations in production. An overall strategy for managing power flow between all interconnected nanogrids is needed. This paper presents a multi-agent system approach for energy management among different nanogrids constituting a microgrid. In this paper, using multi-agent systems, the concept of collaborative microgrids with shareable resources is introduced. That allows the householders of an isolated district or community to collaborate and interact with each other in order to create a stable and proprietary microgrid. In addition, the proposed strategy emphasizes stockage decentralization, programming facilities for the designer. The results show that this approach is perfectly valid and can respond to most problems of centralized energy management systems while establishing a reliable and robust microgrid.

Paper ID: **25**

Cooperative Device to Device Communications with Network Coding

Robithoh Annur, Ooi Yu Hui, Norazira Jalil, Fatiha Subri and Vasaki Ponnusamy

Device-to-device (D2D) is a kind of communication technique where it allows direct communication between user equipment without the involvement of network infrastructure. 5G network is being the cellular network trends nowadays where it enables D2D communication with a huge device connectivity and it is expected to be able to deliver a more reliable and faster network throughput such as high definition video streaming, online gaming and multimedia downloading. This paper presents a formation of multi-hop in D2D communications for more reliable network link and brings more benefits compare to single hop communication systems. It can be enhanced furthermore with network coding technique. Network performance in terms of packet loss rate is presented. The simulation results show that network coding can improve the network performance with low packet loss rate.

Paper ID: **26**

IoT Based Secured Online Attendance Management System

Savitri Bevinakoppa

This paper focuses on a Wi-Fi attendance system framework using IoT devices. Design a system that can dial in attendance using only Wi-Fi. This means that traditional assistive systems, such as biometrics and piercing, can be replaced by this system due to its lack of progress and capacity for human intervention. Attendance management is a complex and time-consuming task that restricts Human Resource (HR) staff to focus on other HR management tasks. Collecting large amounts of data makes data management difficult. Through this paper, a solution to address these problems was recommended by implementing a Wi-Fi assistance system with some additional features like location tracking and automated data storage in cloud server improving data security.

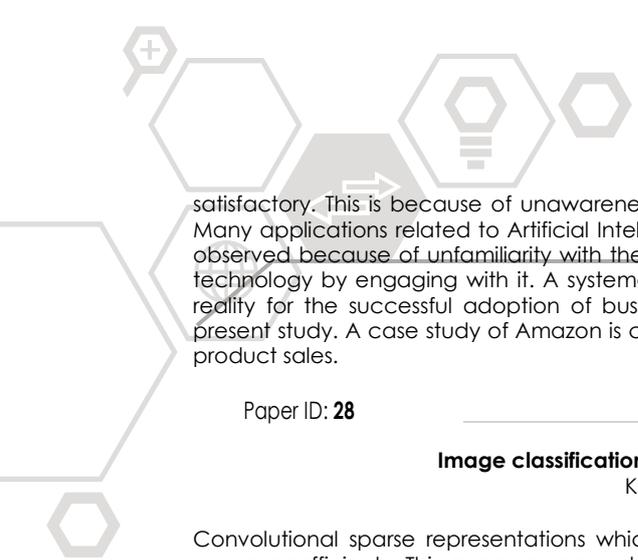
This paper discusses various aspects of this system, such as the software used in application design, the type of database used, the network protocols used for security and its implementation methods.

Paper ID: **27**

Impact of Augmented Reality and Virtual Reality in the Transformation of Virtual Customer Relationship Management Sector

Hamid Raza Malik, Naeem A Nawaz and Musab Bassam Al-Zghoul

The integration of virtual reality and artificial intelligence into the business environment takes human-machine interaction to an advanced level. The inception of these technologies along with deep learning approaches has transformed the business environment completely, especially customer relationship management. Additionally, augmented reality has changed the business production environment with interactive designs and machines learning approaches. Augmented reality is expected to grow by \$814.7B in 2025 which will bring a huge transformation in the businesses. Though leveraging technologies have been introduced to transform customer experience, with an ever-accelerating tidal wave of advancing technology, the adoption rate of these technologies in business is not



satisfactory. This is because of unawareness of the experience transformation rate of augmented reality on business. Many applications related to Artificial Intelligence and Virtual Reality experience were found but no success rate was observed because of unfamiliarity with the key features to the technology. There is a need to introduce the power of technology by engaging with it. A systematic approach to identify the key aspects of augmented reality and virtual reality for the successful adoption of business in customer relationship management sector has been used for the present study. A case study of Amazon is considered to analyze the impact of the implementation of Virtual Reality on product sales.

Paper ID: **28**

Image classification with multi-scale convolutional sparse representation

Kazuki Kitajima and Yoshimitsu Kuroki

Convolutional sparse representations which expresses a signal by a sum of convolutional filters and corresponding sparse coefficients. This paper proposes to employ the multi-scale, namely various size, filters to extract features for image classification. The experimental result shows the proposed method achieved the higher classification accuracy than the conventional one in the convolutional sparse coding classification.

Paper ID: **29**

Outdoor Position Estimation of a Mobile Platform for Precision Farming and Agriculture Automation

Harun Dzulquornain Idris, Muhammad Aizat Zakaria and Ahmad Najmuddin Ibrahim

Precision farming is a topic that is gaining attention due to its potential to increase efficiency and reduce labor workload in the agriculture industry. Automation using mobile robots is expected to revolutionize the industry however, a few technical challenges remain. This research is a test of a low-cost position sensor for application of position estimation of a mobile robot. The objective of is to measure the error produces by an ultra-wideband position sensor and to develop a mobile robot system using the Robot Operating System (ROS). The error generated is analyzed based on the measurements taken in outdoor and indoor experiment environment settings. The Root Mean Squared error method was performed to evaluate the performance of the position sensor. Result of the experiment shows that the installation layout of the sensors and the surrounding environment affects the error generated. It is concluded that the low-cost sensor has sufficient reliability for use in the agriculture setting.

Paper ID: **30**

Restructuring iCheating Model with Cluster Analysis on Affecting Factors of Academic Cheating Behavior

Febby Artwodini Muqtadiroh, Anisah Herdiyanti Prabowo, Raihan Natigor Tarigan, Diana Purwitasari, Mauridhi Hery Purnomo and Apol Pribadi Subriadi

The rapid ICT advancement entails significant impacts to human life specifically in education. One of susceptible drawback of ICT is any attempt to cheat dropping the academic integrity. One of the most commonly frauds found is deceiving by using iPhone exploitable as a media to cheat in exams called as iCheating. iCheating is a form of academic cheating using iPhone. In order to properly cope with the iCheating, the education institutions need to identify factors affecting the iCheating behavior among students to anticipate earlier and to maintain the academic integrity. The objective of this research was to grant recommendations to the education institutions to minimize iCheating. The research was based on iCheating Model developed by Elodie Gentina. Data collected was to 170 students using iPhone based on three main factors observed: emotional intelligence, nomophobia and academic iCheating. Having obtained the data calculation, model restructuring was performed on clustering method to reveal broaden observations what real characteristics represent the students commit iCheating.

Paper ID: **31**

3D static analysis of homogenized piezoelectric plates based on the Mori-Tanaka and the Stroh approach

Nada Tassi, Najat Magouh and Lahcen Azrar

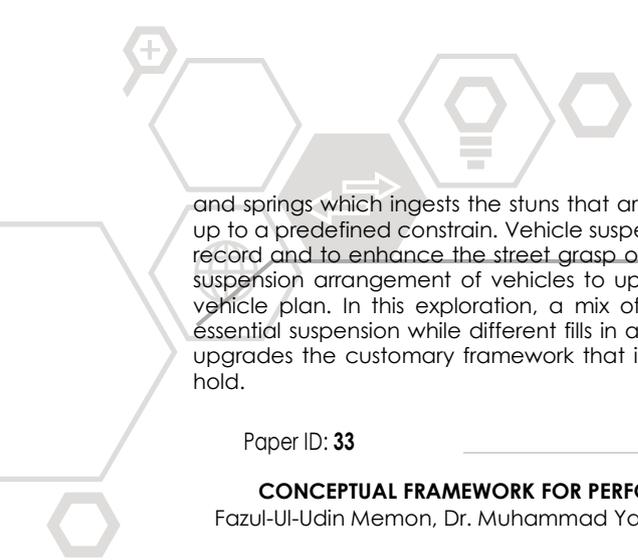
In this paper a mathematical modeling for the identification of effective electro-mechanical properties of homogeneous piezoelectric plates composites is proposed. The effective properties are investigated using micromechanical models based on heterogeneous inclusion problem of Eshelby. The concentration and localization tensors are used based on the Mori-Tanaka micromechanical model. The homogenized coefficients for both electro-elastic and piezoelectric plates are then used to analyze the response of the polarized piezoelectric plate in z-direction. The influence of the direction of polarization as well as of the volume fraction of the fiber inclusion is analysed using the exact solution from the Stroh-like formalism. The Stroh-like formalism solution demonstrate the effect of the polarization direction of Epoxy/PZT-5 and PZT-C91/PZT-5 on the eletromechanical response of piezoelectric composite

Paper ID: **32**

IMPROVING SAFETY & RIDE COMFORT THROUGH DUAL SUSPENSION SYSTEM IN ROAD VEHICLES

Ahmed Raza and Ahmed Raza

The essential objective of the proposed suspension framework is to limit the undesired disturbance of a vehicle because of uneven surfaces on streets. This framework in vehicles is comprise of some fundamental components like dampers



and springs which ingests the stuns that are instigated by unusual streets. In any case, these frameworks can just work up to a predefined constrain. Vehicle suspension frameworks are planned by taking the solace capacity of a traveler in record and to enhance the street grasp on each surface. This examination proposes an idea for structuring a superior suspension arrangement of vehicles to upgrade the nature of the drive without corrupting the dependability of the vehicle plan. In this exploration, a mix of two suspension framework is presented in which one goes about as an essential suspension while different fills in as an optional framework that can adequately lessen the vibrations. This mix upgrades the customary framework that is right now introduced in vehicles without bargaining on solace and street hold.

Paper ID: 33

CONCEPTUAL FRAMEWORK FOR PERFORMANCE ANALYSIS OF TCP IMPLEMENTATION ON VARIOUS PLATFORMS

Fazul-Ul-Udin Memon, Dr. Muhammad Yaqoob Koonthar, Dr. Mansoor Hyder Depar, Dr. Zulfiqar Hussain Pathan and Zeeshan Magsi

The focus of this study is to evaluate the performance and analysis of Transmission Control Protocol (TCP) implementation in various operating systems. In this global and competitive era different operating system and emerging efficient protocols have been evolved. Moreover, recent trend towards the use of different devices to access internet resources has forced different operating systems to implement energy efficient TCP. As TCP is a connection-oriented protocol and mostly involves in high concert networking issues in the end hosts and operating systems. For this proposed study, various operating systems have been used and considered several parameters such as throughput and round trip time. The results of this study indicate that the newer Microsoft Windows client operating system does not bring convincing improvements in network performance compared with its predecessor (Windows XP). However, the newer Windows Server operating systems and Open Source (Linux) operating systems have much higher network performance than its predecessor. This work can help understand what TCP implementations are best to choose from and whether that the choice we suggest depends on certain parameters or limitations.

Paper ID: 34

Betel Nut Addiction Detection Using Machine Learning

Johura Khatun, Samin Yeasar, Tamanna Azad, Md. Ismail Jabiullah and Md. Tarek

Betel nut addiction has become a psychoactive addiction to hundreds of millions of people around the world. Among the four common hallucinatory addictions in the world, betel nut addiction is one of them after tobacco, alcohol, and caffeine. It is more acute in Bangladesh, India, Pakistan and Taiwan. This ancient habit is much harmful to the human body as it contains substances like arecoline which is similar to nicotine. Consuming it on a repetitive basis causes the deformation of dental structure and change in the oral mucosa. Also, people have a risk of facing several diseases such as oral cancer, neck, and head cancer, submucous fibrosis, etc. because of consuming it. Unfortunately, in our country Bangladesh, rural women are more addicted to this harmful practice. Our purpose of this research is to detect betel nut addiction so that we can spread consciousness among the people. In this paper, we detect whether a person is addicted or not to betel nut. Nowadays Machine Learning is the most popular tool of using algorithms that compute data and learn from it for decision making or prediction about something. Thus, we choose Machine Learning approach. We have collected data manually by analyzing some factors from previous research papers on betel nut addiction. We have performed k-nearest neighbor (kNN), Support Vector Machine (SVM), Decision tree, Logistic regression, Random forest and Naïve Bayes algorithm of classification machine learning technique and evaluate them regarding performance matrices with a featured dataset. Among all the algorithms random forest performs the best with the highest accuracy 99.0% with less training time.

Paper ID: 35

Adaptive Channel Estimation and Equalization in Frequency Domain Based on Superimposed Pilot Technique for Vehicular OFDM Communications

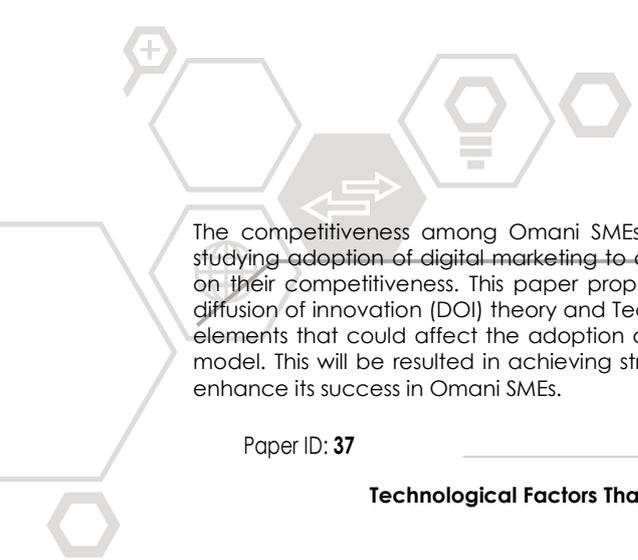
Hasan Farooq and Mandal Al-Kindi

OFDM is considered a promising system against the Inter-Symbol Interference (ISI). However, in vehicular scenario it will be no longer robust against the fast variation of the channel response within the time, these variations as a result of the certain movement between transmitter and receiver with a certain speed and Doppler frequency that mainly degrade the system performance. In this paper we present a low computational complexity channel estimation and equalization implemented in frequency domain for lessening the effect of (ISI) in multipath fast fading channel environment. The proposed technique was successful in fast tracking the channel variation and adjusting the coefficient of adaptive algorithm recursively by using Recursive Least Square (RLS) adaptive algorithm and a Superimposed Training Sequence (STS) for channel estimation purpose. The implementing OFDM with (STS) instead of the conventional pilot sequence avoids the use of frequency multiplex training pilots with the transmitted data symbols that reflect positively in saving system bandwidth. System was simulated over high vehicular speed starts from 50 km/h (31 mph) to 100 km/h (62 mph).

Paper ID: 36

A Model For the Adoption of Digital Marketing And Its Effect on the Competitiveness Among SMEs in Oman

Zuhoor Alghattami



The competitiveness among Omani SMEs is low due to ineffective use of digital marketing. This study focuses on studying adoption of digital marketing to develop a Digital Marketing Adoption Model for Omani SMEs and its effects on their competitiveness. This paper proposes an integrated conceptual model that incorporates factors from both diffusion of innovation (DOI) theory and Technology-Organization-Environment (TOE) model. Further, it adds some other elements that could affect the adoption of digital marketing among SMEs from previous studies to get an integrated model. This will be resulted in achieving strongest findings and recommendations that promote Digital Marketing and enhance its success in Omani SMEs.

Paper ID: 37

Technological Factors That Affect Adoption of Digital Marketing Among SMEs In Oman

Zuhoor Alghattami

Digital marketing has grown significantly in the last ten years. It has provided huge benefits to enterprises, where it enhances services and products of the firms and affects positively the attainment of competitiveness in the market. This study is going to focus on examining the effects of technology factor on adoption of digital marketing among Omani Small and Medium Enterprises, (SME). The research methodology will be a mixed approach using qualitative and quantitative methods. The semi-structured interviews and a structured questionnaire were adopted as data collection tools. These tools will be applied among top management of Omani SMEs. This would enhance the significant of research by covering the benefits of both qualitative and quantitative methods.

Paper ID: 39

Adaptive Multiplexing Technique for Mobile Networks based on SNR

Abdul Ahad Dilshad, Muhammad Irfan, Adil Malik and Arif Aziz

Adaptive multiplexing techniques are used in wireless upcoming and new access systems to meet requirements of high data rates according to channel condition. As number of mobile users are expanding gradually and multimedia demand is also increasing among the mobile users, so now it becomes important to increase the data rates. Multi-carrier code division multiple access (MC-CDMA) and Orthogonal frequency division multiplexing (OFDM) systems are achieved a lot of attraction of researchers as both systems in wireless communication have great ability of providing high data rates. As both systems have ability to overcome many impairments of wireless channel. As both systems are multicarrier, so performance of system in terms of overall system capacity and BER can efficiently and effectively be enhance by using adaptive technique among OFDM and MC-CDMA. By using OFDM and MC-CDMA combination in a system with adaptive concept to get the more data rate efficiency is an effective way. In this paper, performance of adaptive system is analyzed. System is consisting of two sub system OFDM and MC-CDMA. First the OFDM and MC-CDMA performance is separately analyzed in terms of BER. Each system performance is analyzed over Rayleigh channel and AWGN channel by sending and receiving data in terms of BER. Then system is attached with adaptive system. The adaptive system is designed using switch cases between OFDM and MC-CDMA. The switching parameter is SNR of the channel.

Paper ID: 40

CONCEPTUAL FRAMEWORK FOR TRANSFORMATION OF CONVERGED INFRASTRUCTURE (CI) INTO HYPER CONVERGED TECHNOLOGY FOR VIRTUALIZATION OF SERVER INFRASTRUCTURE

Zeeshan Magsi, Muhammad Yaqoob Koonthar, Mansoorhyder Depar, Zulfiqar Hussain Pathan and Fazul Memon

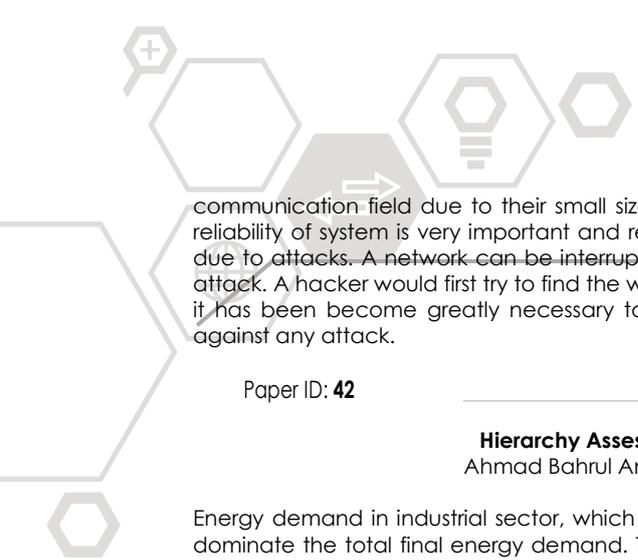
Nowadays, transformation of physical machine-based infrastructure into virtual based system is one of the emerging technologies and a challenging task. In addition to that converged infrastructures obtained much attention in order to maintain the business agility. It also increase the quality, and speed of services delivered to clients. Since the physical server infrastructure implemented on physical desktop for lab environment is resource hungry, which requires a lot of resources as much as the latest applications are installed. It requires maximum hardware consumption, power consumption, high upfront cost as well as it also takes high operational maintenance cost. Hyper converged technology provides ease of acquisition, it can also decrease administrative load as well as decrease maintenance cost and it can also reduce data center foot print. This paper aims to study the transformation of converged infrastructure (CI) into Hyper Converged technology for virtualization of server infrastructure. Tools like ESXi, V-Center, Horizon, SQL Server, File Server and Active Directory has been used to achieve the objective of this study. The findings of this study presents that Converged infrastructure gives a preconfigured package of software and hardware and by using converged infrastructure, the compute, storage, and networking components would be discrete and separated.

Paper ID: 41

Analyze Critical Nodes in WSN by Using Multiple Routing Protocols

Sarfaraz Ali Qureshi, Muhammad Yaqoob Koonthar, Zulfiqar Hussain Pathan, Mansoor Hyder Depar and Fazul-Ul-Din Memon

Wireless sensor network comprises of very small nodes that have the ability to communicate with other devices via transceivers. One of the major challenges is the sensor nodes has to cope with its limited energy and security as they are deployed in a particular open region to sense and collect certain information about some parameters such as temperature, humidity, pressure etc. The rapid growths of wireless sensor networks have attracted a lot attention in



communication field due to their small size and low power consumption. In today's world the networks security and reliability of system is very important and requires special attention otherwise the entire system may get compromised due to attacks. A network can be interrupted by various methods such as natural disaster, failure of devices or cyber-attack. A hacker would first try to find the weakness of system and then will attack the weak point of network. Therefore, it has been become greatly necessary to determine the critical nodes in order to provide protection and shield it against any attack.

Paper ID: 42

Hierarchy Assessment of ISO 50001 Implementation Effectiveness

Ahmad Bahrul Anam, Rahmat Nurcahyo and Muhammad Dachyar

Energy demand in industrial sector, which is considered as the national economy driver, is expected to increase and dominate the total final energy demand. The International Organization for Standardization (ISO) issued the ISO 50001 Energy Management standard which is used to manage energy performance including energy efficiency and consumption. The concept of SNI ISO 50001 uses a Management System model with a Plan, Do, Check, Action cycle approach for continuous improvement. Therefore the design criteria for the effectiveness of the implementation of ISO 50001 can play an important role in industries to support financial savings and reduce environmental impacts. This research was conducted to determine the factors that have a relationship with the effectiveness of the application of ISO 50001. The method of interviewing several expert assessors at the National Accreditation Body of Indonesia and weighting using the Analytical Hierarchy Process (AHP) is a tool in assessing any clauses that are related with the effectiveness of implementing ISO 50001 in medium-sized industries in Indonesia. The results of this study are the obtaining the order of effectiveness criteria (Leadership, Planning, Operation, Performance Evaluation, Improvement and Support), and the order of main clauses on the effectiveness of implementing ISO 50001 (Leadership and commitment, Objectives, energy targets and planning to achieve them, Continual Improvement, Monitoring, measurement, analysis and evaluation of energy performance and the EnMS, Operational planning and control, Communication).

Paper ID: 44

DNS attack mitigation Using OpenStack Isolation

Hassnain Hassan, Rizal Mohd Nor, Md Amiruzzaman and Sharyar Wani

The Domain Name System (DNS) is vital to the Internet, providing a mechanism for resolving hostnames into Internet Protocol (IP) addresses. DNS is known as the world's largest distributed database that manages hostnames and Internet Protocol. By having the DNS, only simple names that can be easily memorized will be used and then the domain name system will map it into the numeric Internet Protocol addresses that are used by computers to communicate. This research aims to propose a model for the development of a private cloud infrastructure to host DNS. The cloud infrastructure will be created using the OpenStack software platform where each server will be hosted separately in a different virtual machine. Virtual network architecture will be created using the Software Defined Networking (SDN) approach and it will be secured using Firewall as a Service (FWaaS). By hosting DNS in private cloud infrastructure, the DNS servers will be out of reach by attackers which will prevent DNS attacks. Besides, available researches had proven that the cloud is the best choice for DNS. A prototype had been implemented and evaluated for its efficiencies. The findings from the evaluation carried out shown a positive result.

Paper ID: 45

Image Classification Using l1 -fidelity Multi-layer Convolutional Sparse Representation

Mizuki Takanashi and Yoshimitsu Kuroki

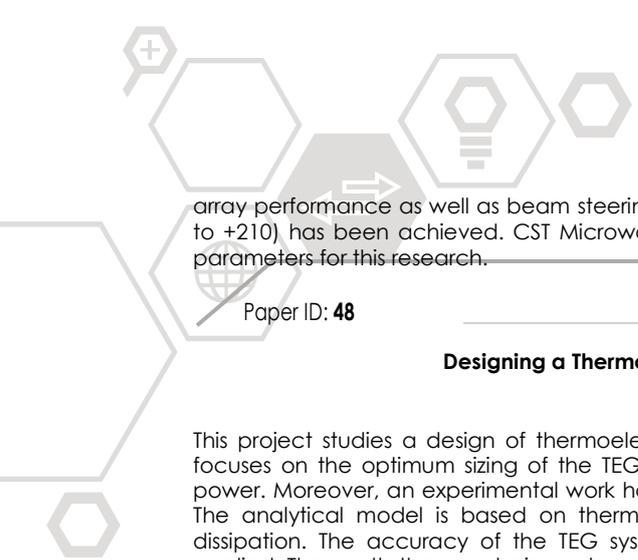
In this paper, we propose an image classification method using multi-layer convolutional sparse representations (CSRs). CSRs model an entire image as a sum over a set of convolutional filters and corresponding coefficient maps. The multi-layer structure is inspired by convolutional neural networks (CNNs). To improve robustness of the filters against outliers, this study tackles designing of the filters in the l1 fidelity criterion instead of the l2 norm. The experimental results show that our method achieves higher classification accuracy on less number of learning images.

Paper ID: 46

Design and Performance Analysis of a Slotted Microstrip Patch Antenna for Different GNSS Frequencies

A. A. M Shah Sadman and Md Hossam-E-Haider

A microstrip patch antenna is more advantageous than other antenna due to its light weight and good control over radiation pattern. A wide range of frequency is supported by this antenna in which satellite frequencies are crucial as the performance of the antenna differs as the frequency changes. Moreover, array antenna constructed using patch antenna also permits beam steering capability which is broadly used in radar, GNSS and GNSS augmentation technology. Variation in patch dimension and configuration lead to change in antenna behavior as well. In this paper, a U-slotted microstrip patch antenna is designed on a FR-4 substrate to investigate the performance of the antenna for GPS, Galileo and GLONASS signal frequencies by revolving the angle of the slot. Comparing among the parameters such as bandwidth, reflection coefficient, VSWR, directivity etc., it is found that the slot angle $Z = 800$ is the optimum orientation. Then 2x2 phased array antennas are constructed for all the aforementioned GNSS signals to examine the



array performance as well as beam steering. The variation in results are studied and a total steering angle of 420 (-210 to +210) has been achieved. CST Microwave Studio has been exploited to design and observe the crucial antenna parameters for this research.

Paper ID: 48

Designing a Thermoelectric Generator for Industrial Flare Heat Recovery

Alaa Attar

This project studies a design of thermoelectric generator TEG used to recover heat from industrial flare. The design focuses on the optimum sizing of the TEG module as well as the optimum load resistance in order to maximize the power. Moreover, an experimental work has been conducted in order to study the accuracy of the analytical model. The analytical model is based on thermoelectric ideal equations and heat sink designed to maximize the heat dissipation. The accuracy of the TEG system increases when the effective material properties technique is being applied. The results then are being extrapolated to real flare sizing to view the total power production on the industrial plant.

Paper ID: 49

Numerical Modelling of Air Driven High-Temperature Phase Change Material Energy Storage System

Faisal Albatati

This paper present numerical modeling and analysis of a small- scale compressed air driven thermal energy storage (TES) system. The system incorporates a packed bed filled with encapsulated phase change material (PCM) of solid-solid type. The X180 Solid-Solid PCM material utilized here has a Phase Transition Temperature of 180 °C, Latent Heat Capacity of 280 kJ/kg, Specific Heat Capacity of 1.40 J/kg, and Volumetric Heat Capacity of 372 MJ/kg. Different parameters were investigated in order to assess the heat storage packed bed performance. The results showed that the PCM capsule size, the height ratio to the storage diameter, has the main influence on the charging process's efficiency. The results also showed that storage efficiencies as high as 90 % could be achieved when the relevant parameters are appropriately selected.

Paper ID: 50

Dangerous Driving Prediction Model based on Long Short-term Memory Network with Dynamic Weighted Moving Average of Heart-Rate Variability

Cheng-Yu Tsai, He-In Cheong, Robert Houghton, Arnab Majumdar, Wen-Te Liu, Kang-Yun Lee, Cheng-Jung Wu and Yi-Shin Liu

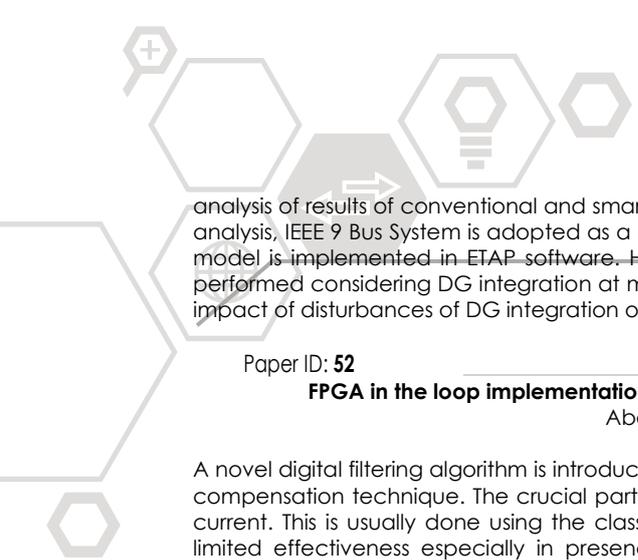
Dangerous driving behaviours contribute significantly to road accidents. Researchers have developed numerous models for predicting dangerous behaviours. However, these models have remained at the development stage. This paper proposes using a dynamic weight moving average (DWMA) method for processing heart rate variability (HRV) indices and establishing prediction models using long short-term memory (LSTM) networks. The changes in HRV indices between baseline and pre-event stages were also investigated. Thirty-three Taiwanese commercial drivers, which were 19 urban drives and 14 highway drivers, were recruited (between September 2019 and June 2020). Their driving behaviours and physiological signals during tasks were obtained by navigation software and an HRV watch. The DWMA and exponential moving average were applied to process the physiological signals. The derived data set was split into training and testing sets (ratio: 80% to 20%). To establish the models, the LSTM networks were trained using the training set and K-fold cross-validation (K = 10). Prediction performance was evaluated by sensitivity, specificity, and accuracy. For the urban drivers, the significantly raised values in the normalized low-frequency spectrum and the sympathovagal balance index were found. The significantly elevated values in the standard deviation of NN intervals were observed. For the highway drivers, the significantly increased heart rate and root mean square of successive RR interval differences can be observed. Besides, the LSTM models based on DWMA demonstrated the highest accuracy in urban and highway groups (Urban driving group: 80.31%, 95% confidence interval: 84.65-91.71%; Highway driving group: 80.70%, 95% confidence interval: 72.25-87.49%). The authors recommend using these models to prevent dangerous driving behaviours.

Paper ID: 51

Operational Performance Assessment of Power Distribution System under Non-Conventional Distributed Generation

Hafiz Qasim Ali, Dr. Syed Abdul Rahman Kashif and Muhammad Haseeb

In order to meet the continuously increasing energy demand, many countries are set to integrate the renewable generation at the consumers' end. In Pakistan, the integration of distributed generation (DG) with the network has already started as legislation is passed to facilitate the work. But this growth of distributed generation is also affecting the power network. The concept of this study originates from the fact that the highly intermittent energy resources like wind and solar, if integrated with power distribution system with power electronic convertors will introduce certain inherited complexities in the power distribution system (often categorized as weak power system). A few of these complexities are increased harmonic content, deteriorated power quality, reduced power system flexibility, reduction in system resilience and issues in stability limits of the power network. In order to facilitate these issues, in this work DG integration at different penetration levels is done so that a suitable approach is proposed (preferably as VPPs) for the integration of distributed generation. In order to propose a smart system with minimum complexities, the comparative



analysis of results of conventional and smart system of all proposed scenarios of DG integration is done. For the detailed analysis, IEEE 9 Bus System is adopted as a conventional network and then modified as per requirements. The proposed model is implemented in ETAP software. Harmonic analysis, load flow, short circuit and transient stability analysis are performed considering DG integration at multiple penetration levels. The results obtained are compared to find out the impact of disturbances of DG integration on network stability and power quality.

Paper ID: **52**

FPGA in the loop implementation of an adaptive-filtering based control of shunt active power filter

Abderrezzaq Zoghbi and Daoud Berkani

A novel digital filtering algorithm is introduced to enhance the dynamic performance of the conventional SRF harmonic compensation technique. The crucial part in the operation of the SRF method is the DC component extraction of the current. This is usually done using the classical low pass filter. This filter, however, presents a delayed response and a limited effectiveness especially in presence of random and timevarying harmonics. To overcome these limits, the proposed adaptive filter based on VLLMS adaptation allows the improvement of the speed and the accuracy of harmonics estimation. As a result, the performance of the Shunt active power filter is improved allowing effective harmonic mitigation. To validate the results, an FPGA in the loop prototype is simulated using SIMULINK and Altera DE1Soc board. The obtained results present a significant improvement in the dynamic response to less than a quarter of a cycle with reduced hardware resources use.

Paper ID: **54**

Most Efficient Perovskite Precursors Molarity for Perovskite Solar Cell

Liem Kevin, Nji Raden Poespawati, Raden Antaredja Kartasasmita, Muhammad Jodie Abraham Isa, Tomy Abuzairi and Retno Wigajatri P.

Solar cell is a relatively new source of renewable energy and this technology is still in its development process, especially for perovskite based solar cell (PSC) which use perovskite material as active layer in the cell structure. Perovskite based solar cell has a very good potential to be one of the most efficient solar cells. Currently perovskite based solar cell has achieved value of efficiency of 22.7%, this value isn't the current highest efficiency value that solar cell could achieve. However, a rapid progression for this type of solar cell could be seen. In this research, the perovskite used is of CH₃NH₃PbI₃ material that is made by a mixture of MAI salt and PbCl₂. In this solar cell perovskite layer is the main material, which mean finding the correct ratio and molarity to produce the most efficient mixed of perovskite is very crucial. This PSC will be grown in between two Fluoride Tin Oxide glass or FTO glass. The solar cell fabricated will be layered in the following order: FTO glass, TiO₂, CH₃NH₃PbI₃, active carbon and paraffin oil, that later on would be closed with another FTO glass. This research will give variables on the molarity of perovskite precursors, which is 0.4M, 0.42M, 0.44M, 0.46M, 0.48M, and 0.5M. It is assumed that the most efficient perovskite particle amount is around 0.4M to 0.5M. From the result of the testing and measurement, it could be concluded that the highest result is 0.48 M with value of 1.48 V Voc, 0.7 mA Isc; and 0.365 fill factor with number of efficiency of 0.569 %.

Paper ID: **56**

Design and Development of Assistive Robotic System for Covid-19

Syed Ahmed, Isho Kiwarkis, Ala Mohammed, Ahmed Hasan, Ahmed Mihi, Mohammed Saeed and Bland Diwali

Nowadays, many advanced countries are taking the advantage of the modern robotic technology to develop and deploy robots in hospitals, airports and healthcare centers to assist the nation combat the deadly virus, known as COVID-19. This Research paper focuses on an artificial intelligence based robotic device that is developed. The robot is equipped with germs and virus killing Ultraviolet (UV) light system along with conventional spraying system for cleaning off any possibly infected area. The robot titled as "Assistive Robot for Covid-19 (ARC-19)" functions on two modes of operations, Autonomous and Semi-Autonomous. Traditionally, the cleaning job is done by cleaning workers, and the healthcare staff have direct contact with the COVID-19 patient. Instead, the developed contactless ARC-19 system can easily disinfect any possibly infected high-touch surface, and reduce the direct-contact between the patient and healthcare staff. After testing the robot, it turns out that the robot was able to kill 98% of the bacteria and other harmful viruses including COVID-19. This could lead to cost-effective, fast, and practical method to reduce the risk on being infected by COVID-19.

Paper ID: **57**

RFID based Security and Home Automation System using FPGA

Mohammad Ehsanul Alim, Md. Nazmus Sakib Bin Alam and Sarosh Ahmad

Security is the basic need of hour and home automation is useful for the ease of people. There are many security systems which are being used in industry, but these are too expensive and difficult to use. There is another issue in the industry due the sequential processing of microcontrollers, which delays the work and consume more energy. In this report we are focusing on a security system to reduce security threats by using advanced equipment such as FPGA programmed by VHDL language. Field Programmable Gate Array (FPGA) based security system can be utilized as a door lock in hotels, banks and everywhere etc. When a Radio Frequency Identification Device (RFID) tag is scanned by an its reader, the door lock will open if the tag information is already stored in the database of FPGA otherwise alarm will ring. Moreover, after opening the door lock, light or fan will automatically be turned on according to the need of that specific user. This project is a combination of two features i.e.; security and automation. Both features are basic

needs in market. Our project can be commercialized in hotels, restaurants, schools, colleges, universities and many other places.

Paper ID: 58

Using SMART sensors and Building Management System to improve the Performance and Productivity for Commercial Buildings

Rahul Dev

In today's world, access to smart devices is quite easy and there was lot of development had been done in last few years. These smart devices like sensors, cameras, actuators, Direct Digital controllers, etc., that makes the buildings becoming more intelligent comfort and safe. These sensors are the integral part of Building Management Systems (BMS) generally refers to high technology and advanced systems that are installed in modern buildings today. Not only does it control, it monitors a building's electrical and mechanical equipment such as cooling plant systems, CCTV, fire as well as security systems. The main emphasis for my research work is to discuss and compare the normal sensor with SMART sensor and to optimize the DDC output system using advance control technique which can both improve the performance and productivity of typical commercial buildings. For this i have divided my research into 03 different section. The first section will analyse normal single I/O's based sensor with performance of SMART sensors. To achieve the object for this section i will be using one of live building floor with 05 zone and going to monitor Temperature, Humidity, Co2 and Occupancy sensor. The data will be recorded for each sensor at interval of 5 min for 4 weeks and will be compared with 4 in 1 SMART sensor. In the next phase i will optimize the BMS controller output using advance process control technique i.e. Model predictive control (MPC) using set of constraints with MATLAB Simulations and prediction. Lastly this will be Validated by the Smart sensor based optimized MPC controller for BMS system. To conclude this, an advance algorithm, and models will be used for SMART sensor which will help the building productivity and improve the efficiency. This study will also underline the potential awareness among buildings owners that there some limitation within the DDC to optimize the performance and prediction that can be overcome by using more advance techniques like MPC.

Paper ID: 59

Exploring the Perceptions of Faculty members and Students on Cloud Computing Adoption in Higher Educational Institutions of Bangladesh

Mohammad Masudur Rahman, Mohd Adam Suhaimi and Noor Hayani Abdul Rahim

The purpose of this paper is to explore on the perceptions of faculty members and students of tertiary institutions of Bangladesh regarding adoption of cloud computing in teaching and learning. The qualitative study used purposive sampling technique for selecting the 10 faculty members and 10 students from four private universities and four public universities of the capital city of Bangladesh. The researchers conducted a semi-structured interview with the participants. The data were coded, categorised and analysed inductively for a qualitative thematic pattern. The findings revealed that the faculty members and students agreed that using cloud computing was completely beneficial for them. However, the participants also opined that for some of them, technophobia towards adopting an innovation, the complexity of using technology, pop-up advertisements and lack of institutional infrastructure and trained staff discouraged them from using cloud computing and adhere to the traditional mode of imparting and receiving knowledge. In addition, lack of awareness and knowledge about cloud computing also hindered them from adopting it. The study is the first initiative to explore the perceptions among faculty members and students in private and public universities in Bangladesh.

Paper ID: 60

Religious Tourism Safety Recommendation System: A Case Study of Religious Sites in Nepal

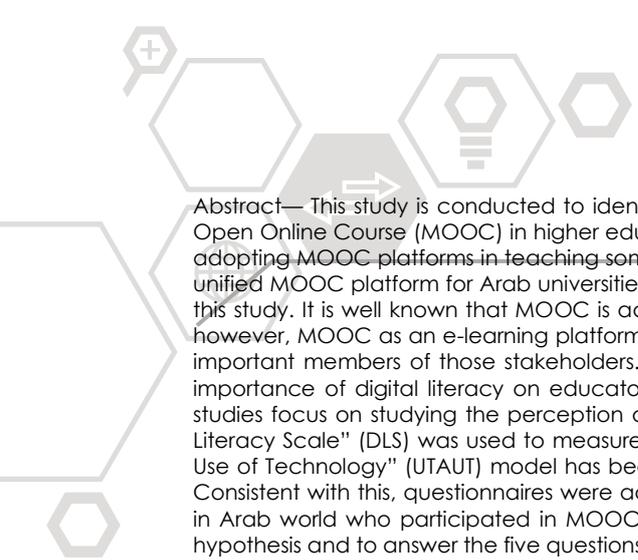
Tan Wenan, Deepanjali Shrestha, Neesha Rajkamikar, Bikram Adhikari and Seung Ryul Jeong

Religious tourism is a special category of tourism in East Asian countries like India, Nepal, Thailand, Indonesia, Bangladesh and Bhutan, etc. Religion is a very sensitive issue and it can lead to chaos and turmoil that may cause serious risk and social disturbance for tourist if they are not aware of religious norms and sensitivity in a religious destination. Further the issues of panhandling, selling fake items, charging excessive amounts and abusing of female tourist in the name of meditation and yoga can be equally devastating. In this work we propose a tourism safety recommendation system for religious tourist to overcome the sensitive issues related to religion and religious destination. We perform an investigation based on tourist data and associated literature of Pashupatinath site of Nepal to gather requirements and build a conceptual religious model. Further, we map this model to design digital reference model, digital conceptual model and tourism safety recommendation system for Nepal. The model is verified with data from religious tourist, managers and security agencies working specifically in religious destinations. This work is first of its kind in the area of religious tourism safety. The work is highly beneficial for the tourist and governing bodies in the management of tourist safety in religious destinations. This work also serves as a knowledge base not only for religious tourism destinations systems but also for other systems with similar domains.

Paper ID: 61

Digital Literacy of Educators and their Attitude Towards MOOC Platform in Arab World

Hana Alqaïdoom and Asadullah Shah



Abstract— This study is conducted to identify the level of digital literacy for educators in Arab world who use Massive Open Online Course (MOOC) in higher education. In addition, the study aims to determine educators' attitude towards adopting MOOC platforms in teaching some of the courses in higher education. In the light of this context, proposing a unified MOOC platform for Arab universities is also considered as one of the important aspects to carry out as a part of this study. It is well known that MOOC is adopted by limited number of higher education institutions in the Arab world; however, MOOC as an e-learning platform requires a specific level of digital literacy for all stakeholders. Educators are important members of those stakeholders. Nevertheless, very few studies have been conducted to shed light on the importance of digital literacy on educators' attitude towards MOOC in Arab countries. Actually, the majority of the studies focus on studying the perception of learners and MOOC users rather than educators. In this study the "Digital Literacy Scale" (DLS) was used to measure the digital skills of educators. Whereas "Unified Theory of Acceptance and Use of Technology" (UTAUT) model has been amended to identify the attitude of educators towards MOOC platform. Consistent with this, questionnaires were administered on a sample of 200 educators from higher education institutions in Arab world who participated in MOOC. Moreover, observations and interviews have been conducted to test the hypothesis and to answer the five questions of this study.

Paper ID: **62**

Foreign Arrival Prediction in Indonesia after Pandemic Based On Google Trends Analytics

Evita Purnaningrum and Hanief Khoyyir Nafah

The industrial sector most affected by the outbreak is the tourism sector. Tourism is predicted to be the main support for state revenue. In addition, until 2019 foreign tourists visiting Indonesia experienced a significant increase compared to the previous year. However, tourist arrival declined sharply during the pandemic and is expected to return in 2023-2025. This encourages researchers to formulate the best projection model for foreign tourists after the pandemic. The projection is based on the Kalman filter. Kalman filter is a state space model that can be repeated to produce high estimation accuracy values. This model is supported by Google Trends analysis which is able to capture other countries' interest in Indonesian tourism, especially during the pandemic. The results showed that despite the pandemic, several countries still have an interest in tourism objects in Indonesia. In addition, Kalman filters have high accuracy in forecasting foreign tourists.

Paper ID: **63**

ProgMath: Enlighten Math and Programming Logics

Mehrunnisa Qureshi, Sumbul Ghulamani and Asadullah Shah

Now days in all educational systems, students of any field experience math anxiety. Moreover, mathematics nervousness is frequently interconnected to reduced accomplishment in math. Math anxiety is the sentiment of fear or awkwardness that obstructs with the capacity to do mathematics. The persistence of this reading scanned the roots of math anxiety in addition explored the approaches to overcome math anxiety. These days in high-tech, progressively linked world, it is essential for computer science students to build self-confidence to do math. There are several applications which are being used to help students in solving mathematics problems but author aims to provide learners a complete platform from which they have understood the concepts of mathematics which supported them to solve problems and construct programming logic. By conducting the surveys in various institutes to think about their decency and challenges they face to solve mathematics problems and doing programming, reviews shows that understudies face numerous troubles and get terrible scholastics grades in view of math anxiety moreover, reviews taken after proposed application which shows that PROG MATH app give them complete mathematics and programming learning platform. Surveys and interviews taken before and after proposed app which shows that students need that type of applications in their establishments.

Paper ID: **64**

The Book Stack: A Free Books and Class Notes Lending Application

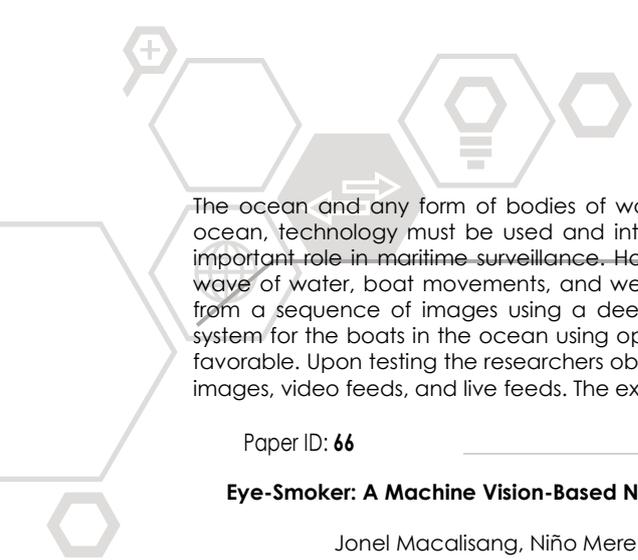
Mikee Rose R. Borromeo, Shaina Beatrice P. Espiritu, Vanessa M. Luma-As and Michael N. Young

COVID-19 is the reason why all schools are forced to implement online classes. A lot of students are having a hard time in this new normal learning style and there are many distractions to consider while students are staying at home. Faculty members and administration are also having a difficulty in presenting an effective lesson strategy to their students. The Book Stack was made to focus on helping students, faculty members and administration in enhancing learning experience by lending textbooks and class notes that can be used as educational materials. This application does not require subscription fees and offers free access to numerous academic notes and acts as a medium for lending textbooks to aid the school community in consideration of the current financial situation of the students because of the pandemic right now.

Paper ID: **65**

Watercraft-Net: A Deep Inference Vision Approach of Watercraft Detection for Maritime Surveillance System Using Optical Aerial Images

Alvin Alon, Jonel Macalisang, Ryan Reyes, Rovenson Sevilla and Gemma Belga



The ocean and any form of bodies of water must be protected and secure from any intruders and to monitor our ocean, technology must be used and integrated for more efficient monitoring. Automatic boat detection plays an important role in maritime surveillance. However, the maritime environment represents lots of challenges such as the wave of water, boat movements, and weather condition. This paper presents a method for detecting moving boats from a sequence of images using a deep learning approach. In this study, the researchers proposed a detection system for the boats in the ocean using optical aerial images. The researchers conducted testing and the results were favorable. Upon testing the researchers obtained a 90% accuracy of detection of the ship in the ocean using the single images, video feeds, and live feeds. The experiments show promising results.

Paper ID: **66**

Eye-Smoker: A Machine Vision-Based Nose Inference System of Cigarette Smoking Detection using Convolutional Neural Network

Jonel Macalisang, Niño Merencilla, Michael Angelo Ligayo, Mark Melegrito and Ryan Tejada

In the Philippines, at least 16 million Filipinos reported smoking cigarettes amid the campaign against tobacco products due to various concerns about their adverse health effects. Due to health, environmental, and safety concerns, the President of the Philippines issued Executive Order 26 s. 2017, imposing a nationwide ban on smoking (use of tobacco including e-cigarettes) in all public places in the Philippines. Despite the implementation of this order, many are still seen smoking in prohibited smoking areas. A smoke detector can be helpful in this situation. This study proposed a smoker detection system that uses a deep learning algorithm that can detect people that are smoking cigarettes. The study used the Pascal VOC format and LabelImg tool for annotating the datasets. Training, validation, and evaluation of the system is done by presenting images, videos, and live detection using the webcam of a camera. Overall, the system produced 90% testing accuracy.

Paper ID: **67**

A Machine Vision-Based Deep Learning Inference Approach of Biker Safety Hat Detection System

Jonel Macalisang, Dennis Ordovez, Mark Kristian Ledda, Mark Melegrito and Ana Marie Obon

In the Philippines road accidents were prevalent among motorcycle riders. The motorcyclist was required to wear their helmet when on the road. Some motorcyclists didn't follow the rules on wearing a helmet as safety precautions on the road. To address this, policymakers are focusing on enforcing safe and law-abiding behavior in traffic. There is, however, a lack of comprehensive data on the safety-critical behavioral metric of the use of motorcycle helmets, especially in developing countries where the main mode of transport is the motorcycle. Targeted enforcement and safety campaigns that are critical for accident reduction are prohibited by this shortage of knowledge. Hence, The researchers developed an algorithm for detecting the helmet that was worn by the motorcyclist, by using a deep learning approach the object detection was done successfully. Based on the annotated images, frames of video, and live feed data that was collected, To detect active bikes, the researchers taught the algorithm to use their helmets. An overview of the algorithm's success on an annotated research data set and a study of available data on the use of human-registered helmets indicate that our approach is extremely reliable.

Paper ID: **68**

Cap-Eye-citor: A Machine Vision Inference Approach of Capacitor Detection for PCB Automatic Optical Inspection

Julie Ann Susa, Erwin Mariquina, Meriam Tria, Cid Mathew Adolfo and Julius Castro

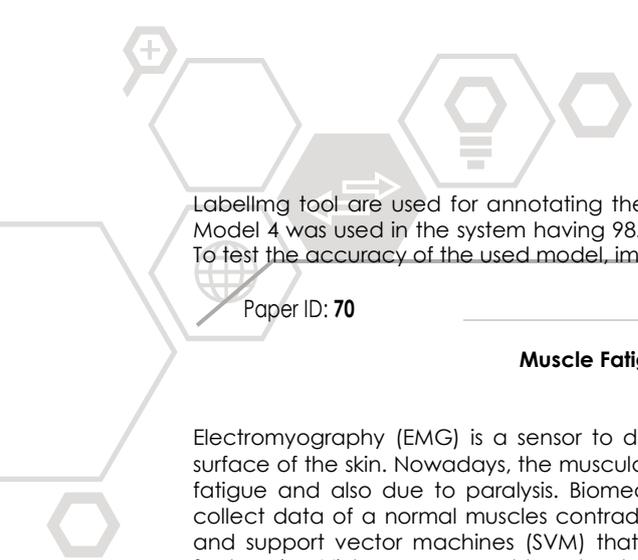
Circuit boards are one of the key elements of the electronics industry. Because of its demand for portable electronic goods, the production of circuit boards has become more significant. The most significant aspect of printed circuit board production is AOI or Automatic Optical Inspection. When generated in a single quantity, the PCB requires a small way to teach and change the AOI method for process validation. This paper proposes a mechanism of detection of capacitors trained on circuit boards using the YOLO V3 algorithm. YOLO is a form of rapid object detection based on the convolutional neural network or CNN. CNN's deep network can distinguish specific characteristics from all the image features. The study developed an AI with the same feature that the manufacturing industry uses to assist students with an effective evaluation of their circuit boards. It focuses on the capacitor in a circuit board. It will not, however, be capable of distinguishing other forms of electronic components. Nearly 60 percent of the entire test has a performance of 100 percent detection, according to the test results, while 33.33 percent is over 70 percent detection and 6.66 percent has a 0 percent detection output.

Paper ID: **69**

Eye-Zheimer: A Deep Transfer Learning Approach of Dementia Detection and Classification from NeuroImaging

Helcy Alon, Michael Angelo Ligayo, Maribel Misola, Allan Sandoval and Marites Fontanilla

Dementia is a common term for memory loss, speech, problem-solving, and other cognitive skills that are serious enough to interfere with everyday life, and Alzheimer's is the leading cause of dementia. Alzheimer's disease is presumed to develop 20 years or more before symptoms occur, with degenerative changes that are unapparent to the person affected. The deep learning approach for early detection and Alzheimer's disease classification has recently gained significant attention. This study proposed disease detection trained by utilizing the YOLO v3 algorithm that aims to detect Alzheimer's disease based solely on Magnetic Resonance Imaging (MRI). Pascal VOC format and



Labelling tool are used for annotating the datasets, categorizing the image as non-demented and mild-demented. Model 4 was used in the system having 98.617% training accuracy, 98.8207% validation accuracy, and mAP of 96.17%. To test the accuracy of the used model, images of MRI scans are presented and it recorded 80% testing accuracy.

Paper ID: 70

Muscle Fatigue Detection and Analysis Using EMG Sensor

Syed Ahmed

Electromyography (EMG) is a sensor to diagnose the health of muscle with a placement of electrode through the surface of the skin. Nowadays, the muscular disorder occurs where the problem is the cause of muscle weakness, pain, fatigue and also due to paralysis. Biomedical applications where the electromyography (EMG) sensor are used to collect data of a normal muscles contradiction and there are two classifier which is linear discriminant analysis (LDA) and support vector machines (SVM) that are prompt to undergo with the process and also mean absolute value feature (MAV) traces are used to extract from the electromyography (EMG). Ascertain part of body muscle targeted with the different subject with certain body mass index (BMI), the movement contradiction of the muscles through the sensor pad electrodes that are attached to the human body where the point of muscles that wanted to observe and the data collected or being used. The study provides guidelines for prediction of muscle fatigue using electromyography (EMG) sensor with classification methods that are approved.

Paper ID: 71

Implementation of Computer-Based Information System on Rice Retailing Business using MS Access

Cielo Jefferson F. de Castro, Vernin R. Felix, Patixia Marie D.C. Adante and Michael N. Young

Rice retail businesses are common in the Philippines because rice is a staple food for the eating population. Constant demand for the grain means that the trade is profitable. Young rice retail stores often utilize the traditional method of tracking inventory and recording transactions—through paper. This study focuses on the implementation of a computer-based information system to streamline the input of customer orders, inventory updates and daily transactions. Results of a time study revealed that application of the proposed system reduced the average task time of the entire process. A paired t-test analysis showed that there is a statistically significant difference between the mean overall task time of the process before and after implementing the proposed system.

Paper ID: 72

Automatic Sinhala News Classification Approach for News Platforms

Gayashan Kirindage and Navod Godewithana

Because of generating various news articles in large scale, online sources moved into an automatic categorization mechanism. This research conducted using LDA topic modeling approach and using other classification algorithms to establish a news categorization solution. Sinhala news websites have only few news categories and does not have any relationship or hierarchies between the categories. Therefore, some users require to search manually and find the necessary articles which are in those categories. Purpose of this study is to build a news categorization model with categorization hierarchies for Sinhala news articles. The goals of the models are to identify the most suitable news category for a related news article and develop hierarchies using generated news categories and assign the news articles according to the hierarchical structure. The final experiments and evaluations show that the solution perform well to solve the automatic categorization problem in Sinhala news platforms.

Paper ID: 73

ArtFora: Phone Application for Artists and Clients

Klarence Emmanuel Decena, Piolo Miguel Rivera, Marian Imee Reyes and Michael Young

Due to the pandemic, online selling has become popular among the business industry. Likewise, the art industry is suffering so they must adapt the same method. Although websites such as DeviantArt, Facebook, Twitter, Instagram, and much more exists, there is no dedicated domain for artists to sell their artworks. This makes transaction between the artists and their clients tedious to do, since measures of contact and agreement between the two parties are lengthy. The necessity to create a dedicated server for selling artworks, commissions, and auctions has never been addressed until the urgency of today's situation. With that said, the paper aims to conceptualize a phone application that replaces the current method to a new transaction system that would consists of: (a) a working page schematic, (b) an improved transactional model, (c) ease of transaction and engagement between parties, and (d) a designed server dedicated only for the business between the artists and their clients. To achieve this, the researchers used various tools for the conceptualization of this phone application. This include the usage of Diagram.net for creating the flow diagrams, and the Balsamiq application for the wireframe of the site. An interview/survey was also conducted on various artist sellers to determine and generalize the grounds of how their transactions are done. Here, the researchers were able to create a concept of a phone application for artists and clients that would not only ease transactions, but also create a virtual portfolio for artists that would help them in their career.

Paper ID: 74

Deep-Hart: An Inference Deep Learning Approach of Hard Hat Detection for Work Safety and Surveillance

The most common cause of injuries in the construction site was caused by falls, slips, and trips. As a response to the Occupational Safety and Health Administration (OSHA), this agency conducted training such as fall prevention. Despite these initiatives, there are still incidents and accidents that happened on the site. According to the study conducted by previous researchers, those fatalities can be reduced by wearing a hard hat. That is why OSHA requires all construction sites to strictly implemented the wearing of hard-hat within the vicinity of the construction site. This study developed a hard hat detection system to determine if the worker is wearing a hard-hat properly. Image processing was used in this study. The proponents used the public datasets with hard hat-wearing images to evaluate the performance by using the mean average precision (mAp) were the proponents obtained an average accuracy of 79.246. The proponents of the detection system of hardhats concluded that regardless of their size, color, types, and angles with an average Training and Validation accuracy of 97.29 and 92.55, average evaluation accuracy of 79.24% with the highest model accuracy of 86.89%, and testing accuracy of 86.67%. The system works properly.

Paper ID: 75

PET-Bottle-Recognizer: A Machine Vision Recognition of Polyethylene-Terephthalate Based- Bottle for Plastic Waste Classification and Recycling

Christopher Cunanan

Recycling of waste materials has been important and well known for the benefits of the environment or economic reasons. The industry still demands efficiency in detecting waste bottles in the surroundings. In this study, the researcher proposed a waste bottle detection system to identify an object such as a waste bottle that was thrown in the surroundings. The proponent used mean average precision (mAP) to evaluate the performance of the model. Upon testing the researcher obtained an accuracy of 100% for the detection of images that was fed in the system. To evaluate the model, the model obtained an accuracy of 85.70% which is good enough. The researcher concluded that the system is efficient in detecting waste bottles. This study is promising to reduce waste in the environment.

Paper ID: 76

Improving the Current System of Online Sellers by Creating Database System using MS Assess

Krishah Ronacel Di. Bilbao, Ken Joshua U. Rebosura, Joshua B. Ilagan and Michael N. Young

The Age of Technology, also known as the Digital Age, has been transforming sales trends and processes over the years. As more companies start to incorporate technology into their own business strategies, the competition just gets tougher and tougher. As a matter of fact, the use of outdated technology has been the problem of many small business owners, as it is known to hurt overall business performance. The researchers have found one seller who would still use an outdated system by manually sending out forms and updating her database, which could be costing her potential clients and sales. This paper then aims to provide a solution to that problem by analyzing information on that system and determining its wastes. The researchers expect an increase in efficiency, as they use MS Access to create a form and a database for the online seller, aside from the addition of a new feature that will allow customer queries. The researchers have found that implementing the MS Access database in the system of individual online sellers increases their efficiency and a lesser chance of making a mistake

Paper ID: 77

Improving Customer Experience on Instagram: Online Food Shop Ordering

Erika Mae Costales, Reynalyn Dizon, Ryan Mark Silvestre and Michael Young

Instagram is one of the most used social media applications, and by creating a business profile for an online business, it allows the owner to reach a wider audience and advertise their shop without spending money. Due to the COVID-19 pandemic, people are given an advice to stay at home which leaded onto ordering all necessities online especially food. This research improved the Instagram's current search engine system by using the Define, Measure, Analyze, Improve and Control Methodology. To apply the proposed system, "Filled" acts as a 3rd party application that has the essential features used in searching for food to order online wherein the accounts from Instagram of online food shops are linked to directly send the orders to shop owners

Paper ID: 78

Mental Disorders Detection Using Social Networking Sites

Jayashree Karad

The popularity of on-line social networking sites ends up in problematic use. An increasing range of mental network social network disturbances, like dependence on informatics relationships, information overload and therefore the recently named network compassion. The indications of those psychological issue square measure ordinarily inactively found out these days, prompting deferred clinical intercession. During this paper, we will in general contend that on-line social conduct mining offers the opportunity to effectively distinguish mental confusion at a beginning time. It is hard to recognize a psychological issue on the grounds that the psychological state can't be watched legitimately in the registers of online social exercises. Our new and creative way to deal with the act of distinguishing mental scatters did not depend on the self-disclosure of these psychological factors through brain science polls. We propose a system of Detection of mental issue in informal communities, which misuses the highlights separated from interpersonal



organization information to precisely recognize potential causes. Our system is assessed through an investigation of clients with various online interpersonal organization clients. We perform an analysis of characteristics and also apply mental disorders in large-scale data series and analyze the characteristics of three types of mental disorders. The results show that mental disorder promises to identify users of social networks based on possible mental disorders.

Paper ID: **79**

Seiton: A Mobile Inventory Management System Application for Micro, Small and Medium-sized Enterprise

Ashley Marie Margate, Ma. Cathyrine Ravina, Jeric James Pido and Michael Young

Micro, Small and Medium-sized Enterprises plays a vital role in a country's economy. However, in the Philippines, they only contribute 25% of the country's total gross value added. This is because of the challenges faced by the entrepreneurs, one of which is poor inventory management. This paper focuses on the current inventory process of Family Milk Tea, a family owned, beverage business in the Philippines. Current process shows loss of sales due to stockout and additional charges due to overstocking. Aside from this, tracking of sales is done manually through writing or typing in a work sheet using Microsoft Excel. This result to inaccuracy in terms of inventory and sales report. As a solution, Seiton, a mobile application will be used to alleviate the problem. Due to mobile phone's universality, this makes Seiton an ideal tool in integrating conveniency and effectivity of Inventory Management System.

Paper ID: **80**

Early Warning Detection System Architecture for COVID-19 via Wastewater

Rudzidatul Dziauddin, Masa Haraguchi Haraguchi, Norliza Mohamed and Ahmad Helmi Abdul Halim

Internet of Things (IoT) platforms are desired for realizing an early warning system of COVID19 detection. The key challenge is to provide solution including sensors to meet the application requirements. We manipulate the diarrhea symptom to assess the COVID-19 case where the virus indirectly can be detected in the wastewater. We proposed COVID-19 early warning detection system architecture from the wastewater comprises of five layers, namely perception layer, connectivity layer, middleware layer, application layer and business layer. Our architecture integrates IoT and machine learning (ML) components to build the total solution. Benefits on the stakeholders can be anticipated including the local authority and hospitals. Key challenges are also discussed in developing the COVID-19 early warning detection system based on the wastewater circumstances.

Paper ID: **81**

Digital Library Database and Distributed Information: A Case Study in Mapúa University

Pauline Gatchalian, Shekainah Kelly Villarama, Christian Jay Sesorio and Michael Young

This study has been undertaken to determine the "Students use of the digital library resources". This study has tried to find out the information in the subjects of the graduate-level students and freshman students their knowledge about the library resources and services made available to them. Furthermore, how their experience with the assets and innovation creates self-viability.

Paper ID: **82**

Implementing an automated Online Job Finder system in the Philippines using MS Access

Leiah Elaisah Dela Paz, Leif Emerson Francisco, France Ponce and Michael Young

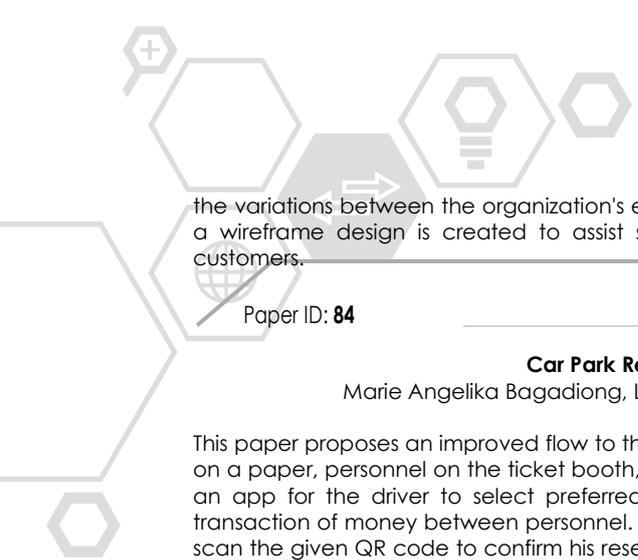
Online Job Finder is a database system for fresh graduates and/or unemployed, and as well as for companies, using Microsoft Access (MS Access). Fresh graduates and the unemployed can apply for a job based on the details they provide such as their name, degree, school, GWA, and academic achievements. At the same time, the company can also find someone they will hire based on their preferences such as their preferred school or GWA or degree. The proposed system is a database system that is convenient for both the applicants and the company especially during the pandemic and because of the emerging technology. This database system is capable of storing the data of the applicant and match their data based on the company's preferences. Despite some existing job finder websites, the researchers believe that this database system is more efficient because applicants can input their data conveniently, they can upload proof of their details which can be verified for authenticity, automatically match them on particular companies, and know the details for the application itself. At the same time, applicants can also verify the authenticity of the company. This study is conducted for the benefit of both people looking for jobs and for companies looking to hire based on their preferences. Instead of going to multiple different companies, and instead of looking through many applicants, the database system instead can match both preferences.

Paper ID: **83**

Designing an Inventory Database Software Suitable for Small Business: A Case Study

Via Shereen L. Daracan, Chelsea Louise D. Padilla, Raycel Joy E. Latayan and Michael N. Young

COVID-19's detection and the rapid dissemination pace have led to many governments' decisive action. The lockout of large parts of society and economic life has arrived as an exogenous shock to many economic actors, not least innovative startups. The study illustrates an entrepreneur who faces problems with inventory management and shows



the variations between the organization's existing system and the proposed database system. At the end of this paper, a wireframe design is created to assist small entrepreneurs in having more accessible communication with their customers.

Paper ID: **84**

Car Park Reservation Using QR System: A Proposed Flow

Marie Angelika Bagadiiong, Lance Albert De Leon, Aimee Anjela Dizon and Michael Young

This paper proposes an improved flow to the current car park system. The current system involves car park ticket printed on a paper, personnel on the ticket booth, and no assurance on car park space availability. The proposed system uses an app for the driver to select preferred car park space, monitor consumed time, and use e-payment to avoid transaction of money between personnel. The QR code will be the key essential to reserve a car park space: driver will scan the given QR code to confirm his reservation, and scan again the QR code upon exit to confirm his payment and clear his data on the car park system.

Paper ID: **85**

Improving and Redesigning the Online Complaint System of the National Bureau of Investigation (NBI)

Josua Noel Catubig, Michaella Alyssa Aquino, Shaine Alysson Cajayon and Michael Young

Despite the decrease of overall crime rate in the Philippines during the lockdown, a worrying growth in the number of crimes happening in the homes of Filipino has been observed during this period. Since the current pandemic restricts people from the usual procedure of filing complaints physically in the NBI office, the official website of NBI must be utilized. This paper aims to present the proposed interface and processing system of the NBI website created through Wix. This developed processing system is designed to be user-friendly and efficient for people who want to file a complaint online. The result in the flow process chart shows that one transportation process sets to be the difference between the existing and proposed layout. It denotes that the existing system is more focused on the physical processing of complaints whereas the proposed system leans on the utilization of the online submission of complaints. Nonetheless, eliminating the transportation process yields a possible decrease of the total time of the overall process, and the new layout presents a more convenient interface for complaint filing which is beneficial for most people who have limited resources in their respective homes.

Paper ID: **86**

Impacts of ICT and innovation on economic growth in advanced countries

Hui Shan Lee, Bik Kai Sia, Choon Wei Low and Shyue Chuan Chong

In the recent decade, the application of information communication technology (ICT) among governments, companies and individuals has kept forward at an accelerating speed. Furthermore, innovation enhances the implementation of new strategies and ideas. Hence, a healthy ecosystem with information communication technology and innovation are the key catalysts for improving economic growth. However, innovation is usually created by bounded exploration of new technologies through a trial-and-error procedure that causes substantial uncertainty. The objective of this study is to examine the impacts of ICT and innovation on growth in advanced countries. This study employs a comprehensive dataset that includes five sub-components for ICT indicator and six sub-components for innovation indicator. By using panel regression random effect model and the data from 27 advanced countries spanning from 2001 to 2018, the robust results showed that the overall impacts of ICT and innovation are positive and statistically related to economic growth. Nevertheless, the sub-indicators, namely individuals using the internet and patent applications from residents exert negative and significant relationship with economic growth. The implication of the present study highlights that the internet may harm economic development, possibly due to cybersecurity risk. Besides, patent applications are usually filed by the wealthiest individuals and the benefits are concentrated in the hands of capitalists, it may cause unequal sharing of national wealth that hampers economic development. Therefore, the policymaker should ensure the effective usage of these contemporary ICT applications and equal sharing of opportunities for innovation in improving sustainable economic growth.

Paper ID: **87**

Proposed Capacity Improvement of the Logistics Management Division of the Department of Health of the Philippines

Alexander Magnata, Leonard Rassel Manlapas, Regina Pia Krizzia Tapiceria and Michael Young

The Department of Health of the Philippines faces several challenges when it comes to the utilization and distribution of health-related products and commodities. With over-lapping roles between different branches of the DOH, lack of centralized distribution management, and poorly designed information systems impedes the execution of different government health programs that requires these goods to be delivered to function properly. Without well-defined department roles, and information systems; procurement processes and distribution of goods face many technical issues such that these goods are being underutilized and are stored in government or third-party warehouses until it is picked up for distribution or thrown out because it expired. The paper proposed a change of structural roles of the Logistics Management Division of the DOH and adjustments to the National Online Stock Inventory Reporting System. The proposed adjustments of division roles and system would help solve issues involving monitoring program stocks requirement and distribution, overlapping department roles, centralize decision-making processes, and provide

relevant information for data processing, monitoring, and evaluation of programs and performance.

Paper ID: 88

Shoplifting Prevention System for Fitting Rooms

Catherine Mikaela Micu, Jeunise Piamonte, Marc Luis Siladan and Michael Young

This paper proposes an improved system to prevent shoplifting in fitting rooms. The proposed system involves using an application which would reflect the item code of a merchandise that a customer will bring inside the fitting room. The item code of every merchandise is unique and would be the primary key in order for the application to process.

Paper ID: 89

Natural Language Processing based Question Answering Techniques: A Survey

Ammar Arbaeen and Asadullah Shah

Abstract— Rapid growth in the field of data science and widespread usage of information retrieval techniques has enabled the humans to retrieve the most accurate information. The diverse and humongous data availability in various formats introduces enormous challenges for data retrieval using Information Retrieval techniques. This paper highlights the Question Answering (QA) system that enables the user to express questions and retrieve the relevant answers in natural language. The QA system consists of four major modules that include Natural Language Question (NLQ) processing, documents processing, passages processing and answer processing. Basically, this intelligent QA system integrates several techniques from many fields such as natural language processing, information retrieval, and knowledge representation in order to process NLQ and retrieve the most concise answer from stored document. This paper provides a comprehensive survey on numerous question answering systems, their general architecture, types and working in detail.

Paper ID: 90

Cobot Fleet Management System Using Cloud and Edge Computing

Bukhary Ikhwan Ismail, Hishamadie Ahmad, Mohammad Fairus Khalid, Mohd Nizam Mohd Mydin, Rajendar Kandan and Hong Hoe Ong

Industry Revolution 4.0 transforms the base of process in product design, fabrication and usage of product. It revolutionize how manufacturing operate, maintain and perform service. Information Technology is an important area in IR4.0 that drives the digitalization of manufacturing. The convergence of Information Technology with Operational Technology forms the crux of Smart Manufacturing. Contemporary manufacturing systems are still evolving. Currently the industry progresses from basic mechanical assist systems to advanced automation such as the use of Collaborative Robot. Collaborative robot (COBOT) is a mechanical device that manipulates objects. It is one of smart device suitable to be adapted in Industry Revolution 4.0. It is designed to share the same workspace with humans making collaboration between the two possible. This paper presents an early concepts and proposal of Cobot Fleet Management System that manages multiple COBOT on factories. The goal is to automate and simplify development and maintenance of COBOT. The management system is a dual sided architecture, cloud centralized control and management of smart equipment and secondly, edge computing that bridge between the manufacturing floors and the application residing in the cloud. We provide health data and automation of selected maintenance task for COBOT by providing error notification, predictive maintenance and production output visualization.

Paper ID: 91

An Operational View into Docker Registry with Scalability, Access Control and Image Assessment

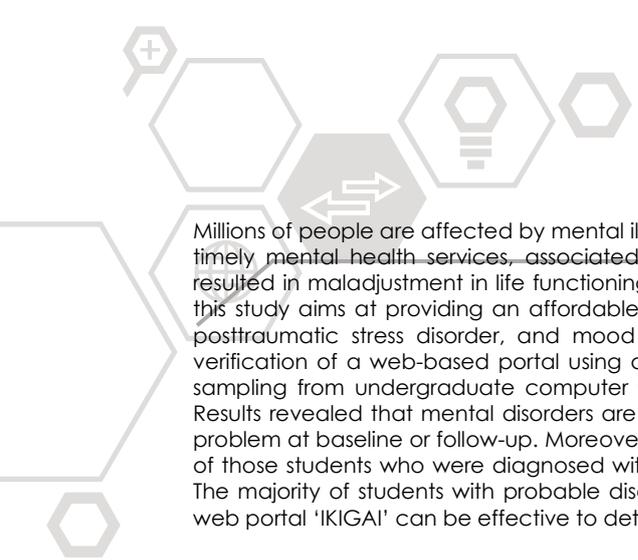
Mohd Nizam Mohd Mydin, Bukhary Ikhwan Ismail, Mohammad Fairus Khalid, Hishamadie Ahmad and Rajendar Kandan

Docker has been the de-facto platform to host container thanks to its simplicity in the deployment of containers. Container in itself is a form of virtual machine but without the weight of emulating hardware resources. It is an abstraction of application layer that combine code and dependencies that is isolated from the host. Today Docker Registry is extensively used due to the popularity of containers in the realm of microservice architecture. Container orchestration tools such as Docker Swarm, Kubernetes and OpenShift, simplify the deployment of containers. It has accelerated the usage of containers to an unprecedented level. This emergence prompts a demand in centralised repository where in previous instalment, the container images were kept locally. Putting images in a central location is a great way for distributed Docker environment as mentioned above. It solves the main problem of sharing images among nodes. This however, exposes the Registry in a vulnerable spot from availability and image vulnerability and security point of view. In this paper, we will outline some of the challenges that a central repository poses. We then propose several practical approaches to overcome the challenges. We integrate web proxy as a means of balancing web request, adding user management with access control list and include an image assessment tool to facilitate with vulnerability scanning.

Paper ID: 92

Development of a web portal 'IKIGAI' to assess the psychological well-being of university students

Tahira Anwar Lashari, Sana Anwar Lashari, Murtaja Ali Saare, Saima Anwar Lashari and Ebaad Amin



Millions of people are affected by mental illness which remains unnoticed due to lack of awareness, use of appropriate, timely mental health services, associated stigma, and limited resources. Ignorance leads to serious consequences resulted in maladjustment in life functioning. Since adulthood is a period prone to heightened emotionality. Therefore, this study aims at providing an affordable web portal 'IKIGAI' for the university student to assess anxiety, depression, posttraumatic stress disorder, and mood disorder. The current study addresses the development, validation, and verification of a web-based portal using a mixed-method research design. Data was gathered using simple random sampling from undergraduate computer science university students. Data were analyzed using ATLAST ti and SPSS. Results revealed that mental disorders are prevalent as over half of students suffered from at least one mental health problem at baseline or follow-up. Moreover, 60% had at least one mental health problem two years later. Less than half of those students who were diagnosed with a mental health problem received treatment between those time points. The majority of students with probable disorders were aware of the need for treatment. Hence, the importance of a web portal 'IKIGAI' can be effective to detect students' depression, anxiety, and stress.

Paper ID: **93**

PERSONALIZED PRODUCT RECOMMENDATION ALGORITHMS WITH SPARSE DATA: A REVIEW

Masoud Ghorbanian

In the increasingly competitive market, users usually have to face a huge number of products. Therefore, the design and sense of a product is increasingly important [1]. On the other hand, users' behaviour is changing, and these changes are creating pressure on the profits of established brands, while at the same time margins on new and previously unknown brands are exploding which is not considered in the recent researches. Moreover, the existing algorithms are not fully covered the divers items in the recommendation list. Hence, the main purpose of this research is to investigate and analyze the product recommendation algorithms with the focus on unpopular products and diversity.

Paper ID: **94**

Smart Assistance for Disables using Bluetooth and Arduino

Ali Raza, Muhammad Ahsan Qadeer, Zoha Tariq, Zain Ahmed, Saqib Yousaf and Asadullah Shah

Day by day as the technology is growing it is reducing the human effort. We present the concept of automation. As the system will provide interaction of users who are partially impaired or completely disabled. The system will also enable a user to maintain and administrate home appliances using a smartphone application. The results will show that it could be part of assistive technology for disabled persons without any third person's assistance. The android application will be used to communicate between the disable users and the caregivers. The objective to develop this application work to propose and develop an Internet of Things (IoT) based system for physically disable peoples. "Voice Controlled Home Automation for People with Disabilities" is designed to assist the people with physical disabilities, bedridden or elderly to control the electrical home appliances using android application. Mostly the bedridden and elderly people find it difficult to operate the home appliances. This system uses voice commands as well as the switches to operate the electrical appliances in home. An android application is used to get the voice commands from user. A Bluetooth Module is used, and the home appliances are connected to Arduino UNO board using relays. Hence the entire system is very cheap, it can be used by every people to reduce their effort and time.

Paper ID: **95**

Exploring the use of Digital Storytelling in Students' Motivation to learn Seerah (History of the Prophets) subject

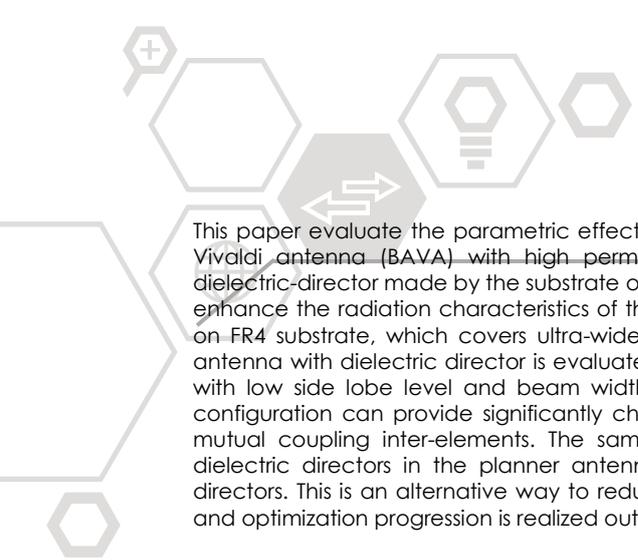
Madihah Sheikh Abdul Aziz

Digital Storytelling (DS) has been popular in education since the 1990s, however, the use of DS with Augmented Reality (AR) technology in teaching the Seerah (History of the Prophets) subject in school is scarce. AR is one of the most evolving technologies that is being implemented in various fields such as military, medical, advertising, entertainment, and particularly in education. The benefit of AR is well known for its interaction with virtual objects in a real-world environment. This study aims to extend the benefits of AR to the digital storytelling for teaching Seerah subject, a case of Prophet Nuh a.s, as a medium to complement the existing teaching method for teachers in telling a story about the Prophets to the school children. The aim is to explore the use of DS with AR technology in providing an immersive experience, to motivate children to focus, and to remember the story. To this end, a series of interviews with the experts and a survey with school children and parents have been carried out to gather the user-requirements and expert opinions throughout the development and implementation of the application. Upon completion, another series of User Acceptance Tests were conducted with the experts and school children. The findings suggest that the use of DS through AR, packaged with a colorful storybook might be an important and effective tool that can be utilized in learning environments to support and motivate primary school children in understanding, remembering, and ultimately to learn the lessons from the Seerah Subject.

Paper ID: **96**

Study of Parametric Effects due to Mutual Coupling using High Permittivity Dielectric-Director in Planar Array Configuration

Faraz Shaikh, Sheroz Khan, Bilal Ahmad Alvi, Ahm Zahurul Alam and Dominique Baillargeat



This paper evaluates the parametric effects due to mutual coupling between inter-elements using balance antipodal Vivaldi antenna (BAVA) with high permittivity dielectric director in an array configuration. An elliptical shaped dielectric-director made by the substrate of Rogers RO-3010 with high permittivity of $\epsilon_r=10.2$ is used with BAVA in order to enhance the radiation characteristics of the antenna in focus. An antenna ($66\text{mm} \times 60.75\text{mm}$) in dimension designed on FR4 substrate, which covers ultra-wide frequency band of 114.28% from 3GHz to 8GHz. The performance of an antenna with dielectric director is evaluated in a capacity of gain enhancement, directivity, regular radiation pattern with low side lobe level and beam width. Further, the use of dielectric directors in planar antenna array based configuration can provide significantly change in radiation characteristic and also provide help in the reduction of mutual coupling inter-elements. The same results can be obtained by using four elements with high permittivity dielectric directors in the planar antenna array based arrangement instead of eight or more elements without directors. This is an alternative way to reduce the number of elements in an antenna array based system. The design and optimization progression is realized out using CST simulation software.

Paper ID: 97

Effect of Mach number and Level of Expansion on Flow Development at Different Lengths of Ducts with Sudden Expansion

Mashtaqahamed Attar M, Ridwan Ridwan, Hamza Afser Delvi, Mohammed Faheem, Suheel J I and Sher Afghan Khan

This study investigates the impact of the level of expansion on the flow of the duct. The pipe diameter is 18 mm, and tests were done at Mach 1.8, 2.0, and 3.0. When there is an adverse pressure gradient at the nozzle exit, the wall pressure attains high values are mainly due to the presence of the oblique shock waves. For this case, when the flow control technique is used, it decreases pressure in the duct. At the design nozzle pressure ratio (NPR), the wall pressure results show a similar pattern for Mach 1.8 and 2.0. Among them, there are marginal variations seen due to the change in the duct length, impact of the backpressure, and interaction of the shock waves. However, at $L = 2D$, the flow remained attached to the circular pipe wall. The flow pattern with and without control are similar. There is a marginal change in the duct's flow pattern, and fluctuations in the normalized wall pressure are relatively large. For the lowest duct length, despite the flow being attached to the tube's wall, the pipe pressure attains the ambient pressure value due to the freestream pressure impact.

Paper ID: 98

Effect of NPR on the Flow Pattern of Circular Pipe at High Mach Numbers

Mohammed Faheem, Ridwan Ridwan, Hamza Afser Delvi, Mashtaqahamed Attar M, Suheel J I and Sher Afghan Khan

This paper aims to evaluate the impact of dynamic control on the stream's nature in an abruptly expanded conduit of a diameter ratio of 2.2. The investigation was done for Mach 1.6, 1.8, 2.0, and 2.5. Results are shown when control renders any change in the flow field. It is found that at Mach 1.6 for $\text{NPR} = 7$ together with the tube size of $L = 10D$, the jets' noise is considered in the control mechanism's nonappearance and existence. The results show that there is a significant decrease in the noise level, and jets become quiet. It is also observed that whenever the jet's noise is low due to the microjets, the base pressure is also minimum. At Mach 1.6, 1.8, and 2.5, the control findings decrease the duct's pressure value for most of the cases. However, in the case of Mach 2.0, when the control is activated, it increases the duct's static pressure. The microjets do not interrupt the flow field in the pipe adversely.

Paper ID: 99

Experimental Investigation on Nozzle Flow at Different Levels of Jet State at Supersonic Mach Numbers with Sudden Expansion

Mohammed Faheem, Ridwan Ridwan, Hamza Afser Delvi, Mashtaqahamed Attar M, Suheel J I and Sher Afghan Khan

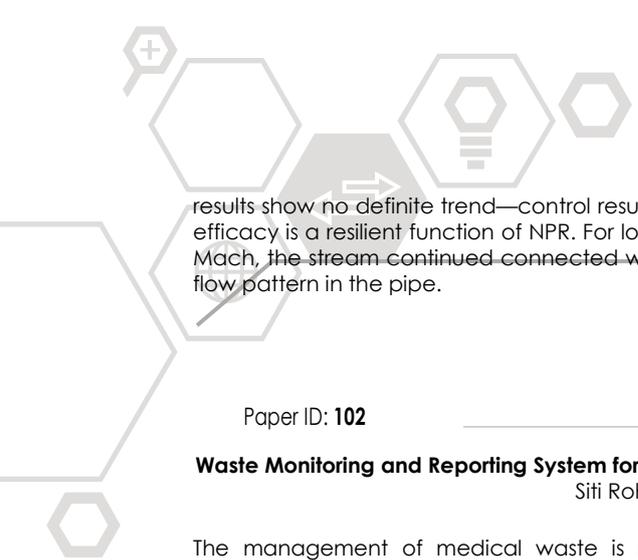
This study depicts the experiment's outcomes to assess the control mechanism efficacy when activated at the base recirculation zone for an area ratio of 4.84. The convergent-divergent (CD) nozzles with Mach numbers considered were from 1.25 to 3, and experiments were done for correctly, imperfectly, and under-expanded cases. For low Mach numbers, namely $M = 1.25$ and 1.3, variation in the duct's flow is identical, and control is not useful. However, there is an increase in the fluctuation level from Mach 1.6, and its growth continues until the study's highest Mach number. For Mach 1.48 and 1.6, the flow management scores increased the pressure in the pipe. For Mach 1.8, the effectiveness shows a mixed trend. This trend gets reversed at Mach 2, and when the flow control mechanism is used, it reduces pressure. For the largest Mach 3 of the study, the control efficacy is negligible, and the microjet does not negatively impact the flow field.

Paper ID: 101

Studies on the Nozzle Flow and the Flow Pattern with Abrupt Increase in Area

Mohammed Faheem, Ridwan Ridwan, Suheel J I, Hamza Afser Delvi and Sher Afghan Khan

In this investigation, experiments are done for Mach 1.25, 1.3, 1.48, 1.6, and 1.8, and for different duct lengths and the nozzle pressure ratio to evaluate the microjets' control effectiveness for a diameter ratio of 2.5. The results indicate that the stream pattern in the pipe is matching for most of the instances. However, the results are shown only for a combination of parameters with a discrepancy in the stream pattern due to a stream management mechanism. The



results show no definite trend—control results in both positive and negative trends inside the duct flow field. The control efficacy is a resilient function of NPR. For lower NPRs, the minimum duct requirement is 3D, but at higher NPR and lower Mach, the stream continued connected with the duct for 2D length. The marginal change in the inertia level does the flow pattern in the pipe.

Paper ID: 102

Waste Monitoring and Reporting System for Community Health Center in Depok, Indonesia Habibullah Akbar, Sirin Fairus, Siti Rohajawati, Hoga Saragih and Puji Rahayu

The management of medical waste is mandatory in sustaining environmental especially in populous countries. Currently, there is a gap within the management practice of medical waste between health-care facilities and landfill. Many of these facilities also do not have freezing facilities and making the wastes becoming more dangerous for health. To alleviate this problem, it is necessary to develop an information system that can monitor and control the movement of medical waste from cradle-to-grave. To obtain the requirement for this system, we use a series of observation, surveys, and focus group discussion. We begin with a low-fidelity prototype of this system and evaluate it with system usability scale. The findings have shown that the system should be able to generate multiple reports from ontological data. It is also interesting to note that the healthcare operators and officers require training to use this system. Moreover, from the evaluation then we improve the fidelity of the prototype to web-based application to allow public health officers to access the system from their smartphone and computers.

Paper ID: 103

Studies on Nozzle Flow at Beneficial and Adverse Flow Conditions and Effectiveness of Flow Control Management

Mohammed Faheem, Ridwan Ridwan, Suheel J I, Hamza Afser Delvi and Sher Afghan Khan

The present study focuses on developing the flow pattern in a suddenly expanded duct of diameter 25 mm. Accordingly, CD nozzles were designed using isentropic relations. Mach numbers of the current study are 1.48, 1.6, 1.8, and 2. Experiments were done at the design NPR, adverse pressure, and the beneficial pressure. When the tests are done, using dynamic control is ineffective at Mach 1.8 at design NPR. For Mach 2, the flow control is useful. It increases the pressure when the same flow management technique is used for a fixed level of over-expansion of 0.277, and control efficacy is insignificant. The flow field is identical with no control and control. When the investigation was done for an under-expanded case, the dynamic control increased the pipe pressure.

Paper ID: 104

A comparative analysis of photovoltaic solar and geothermal heating and cooling systems

Muhammad Salman, Zavier Aguirre, Lukas Korn and Muhammad Hassan Tanveer

This report will focus primarily on geothermal heating and cooling systems and photovoltaic heating and cooling systems. Geothermal in the United States varies from region to region. For the state of Georgia, geothermal energy is mostly used for geothermal heat pump applications to either heat or cool a residential or commercial property. Similarly, photovoltaic (PV) solar energy is most effective in certain regions of the United States. Solar energy is extremely popular in places with plenty of sun, such as Southern California. Taking two studies focusing on geothermal and PV solar cooling, This report will take two studies focusing on geothermal and PV solar cooling and compare the findings to provide a breakdown of the most cost effective and efficient alternative energies for a Georgia household wanting to save on monthly utility costs.

Paper ID: 105

Optimal Decentralized Energy Management of a Smart Home based on Energy Democracy

Mohammad Mehdi Salehi Dezfouli, Peyman Afzali, Masoud Rashidinejad and Amir Abdollahi

Nowadays the smart homes have a significant impact on increasing decentralization of smart grids. The penetration of the renewable resources and residential energy storage systems (RESSs) in smart homes could lead to more decentralization and democratization of the smart grid. On the other hands, renewable energies such as photovoltaic panels are faced with uncertainty. The RESSs are able to be used as a reserve of PVs. In this paper, the optimal energy management and optimal bidding strategy are obtained for a smart home consists of residential rooftop photovoltaic system (RRPS), residential demand response program (RDRP), and RESS. The mixed integer non-linear programming (MINLP) model of the problem is solved by COUENNE in GAMS software. In this paper, a flexible energy democracy (FED) index and a concept for energy democratization and its development tools are presented. The RDRP and RESS are considered as the flexibility tools of the smart home. Numerical results show the expected profit of all resources is increased and the related risk is reduced by the presented decision making model and bidding strategy for RRPS, RDRP and RESS.