UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Razak Faculty of Technology and Informatics

RRW2021
RAZAK RESEARCH WEEK 2021

RAZAK ANNUAL TECHNOLOGY, INFORMATICS AND POLICY SEMINAR (RATIPS) 2021

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Enabling Digital Transformation for Society

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7 DECEMBER 2021

ABSTRACT BOOK

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RATIPS

Razak Annual Technology, Informatics and Policy Seminar 2021 (RATIPS 2021) is one of the activity in conjunction with Razak Research Week 2021. This seminar is an event, organized to provide a platform for academicians, researchers, managers, industrial participants and students to share their research findings with experts. All full paper submissions will be peer-reviewed and evaluated based on originality, technical and/or research depth, accuracy and relevance to the conference call for papers. RATIPS is divided into four tracks covering on Science Management and Design, Engineering, Informatics and Policy.

Keynote Speaker

MR. AZIH YUSOF
Deputy Director General, Malaysian Administrative Modernisation and
Management Planning Unit (MAMPU)
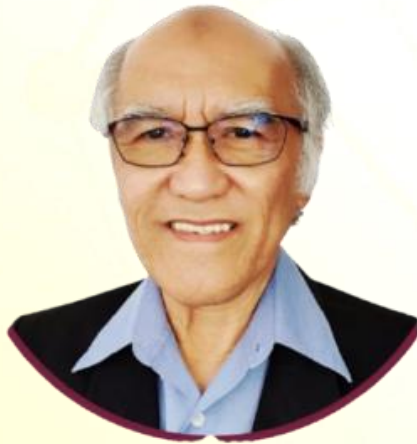
IR DR ABU AZIZ HASSAN
Adjunct Professor
Razak Faculty Technology And Informatics

Schedule

TIME	AGENDA
8:50 am - 9.00 am	Participant Registration
9.00 am - 9:05 am	Ceremony Begins
9.05 am - 9.10 am	Doa Recitation
9:10 am - 9:20 am	**Welcoming Remarks** Prof. Dr. Astuty Amrin Dean Razak Faculty of Technology and Informatics
9:20 am - 9:40 am	**Razak Research Week (RRW 2021) Officiating Ceremony** YBhg. Prof. Dr. Rosli Md Illias Deputy Vice-Chancellor (Research and Innovation) Universiti Teknologi Malaysia
9.40 am - 9:45 am	**Virtual Photography Session**
9.50 am - 10:50 am	**Keynote Session 1** Speaker 1: En. Azih bin Yusof Unit Pemodenan Tadbiran & Perancangan Pengurusan (MAMPU)
11.00 am - 12:00 pm	**Keynote Session 2** Speaker 2: Ir. Dr. Abd Aziz Hassan Adjunct Professor Razak Faculty of Technology and Informatics
12.00 pm - 2:00 pm	Lunch Break
2.00 pm - 3:30 pm	Parallel Session 1 Breakout Room - Engineering and Technology (ENT) - Informatics 1 (INF 1) - Informatics 2 (INF 1)
3.45 pm - 5:00 pm	Parallel Session 2 Breakout Room - Engineering and Technology (ENT) - Informatics 1 (INF 1)

Parallel Session 1

Webex Link   : https://tinyurl.com/RATIPS2021

Time   : 2:00pm-3:30pm

Chairperson   : Dr. Siti Haida Ismail

Assisstant Chair : Dr. Wan Normeza Wan Zakaria

Track   : Engineering and Technology (ENT)

(Breakout Room)

Time	Paper
2:00pm – 2:15pm	Augmented Reality In Cultural Heritage Tourism: A Review of Past Study *Mohd Hairul Fadli Hairul Mohd Hashim, Roslina Ibrahim*
2:15pm – 2:30pm	Building Information Modeling Level 3 Execution Process Guideline For Construction Industry Players *Muhammad Ashiq Marecan, Noor Irza Mohd Zaki*
2:30pm – 2:45pm	Current Situation And Countermeasures Of Food Quality And Safety In China *Bingqing Zhu, Hayati Abdul Talib*
2:45pm – 3:00pm	Development And Characterisation Of Recycled Polylactic Acid Reinforced Pineapple Leaf Nanocellulose Filament For 3d Printing Applications *Ariff Farhan Mohd Nor, Zainudin A Rasid, Mohamad Zaki Hassan*
3:00pm – 3:15pm	Recent Progress In Selective Laser Melting Of Titanium Alloys For Biomedical Applications *Aufa Adlia Nazari, Mohamad Zaki Hassan, Zarini Ismail*
3:15pm – 3:30pm	Recent Development Of Natural Fiber For Nanocellulose Extraction And Application *Wan Nur Zulaikha Hasnul Hasrin, Mohd Zaki Hassan*

Parallel Session 1

Webex Link : https://tinyurl.com/RATIPS2021

Time : 2:00pm-3:15pm

Chairperson : Dr. Ganthan A/L Narayana Samy

Assistant Chair : Dr. Noor Hafizah Hassan

Track : Informatics 1

(Breakout Room)

Time	Paper
2:00pm – 2:15pm	Systematic Literature Review (SLR) on Crime Prevention Through Environmental Design (CPTED) in Residential Areas *Reevan Seelen Jagamogan, Hafiza Abas, Saiful Adli Ismail*
2:15pm – 2:30pm	A review of agriculture crop disease detection using deep learning *Muhammad Solihin Kadir, Mohd Syahid Mohd Anuar*
2:30pm – 2:45pm	The Effectives Strategies On Covid-19 Infection Prevention And Control Among Healthcare Workers *Nurmasitah Mohamad Nazri, Mohd Azri Mohd Izhar*
2:45pm – 3:00pm	Decentralized Offloading via Multi-Agent Deep Reinforcement Learning in Vehicular Edge Network *Ahmad Ariff Aizuddin Mohd Atan, Rudzidatul Akmam Dziyauddin*
3:00pm – 3:15pm	A Review of User Experience patterns in the Learning Management System Context *Mohammed MHH Alhejaili, Roslina Ibrahim*
3:15pm – 3:30pm	A Cloud Computing Adoption Challenges In Financial Institution *Nor Elsa Furzanne Mohd Kami , Ganthan Narayana Samy,* *Noor Hafizah Hassan, Norshaliza Kamaruddin, Sundresan Perumal,* *Pritheega Magalingam*

Parallel Session 1

Time	Paper
2:00pm – 2:15pm	Stock Trend Behavior Prediction Using Machine Learning Techniques And Trading Simulation *Sheau Chang Liau, Nilam Nur Amir Sjarif, Doris Wong Hooi Ten*
2:15pm – 2:30pm	Transfer Learning Based Network Performance Comparison Of The Pre-Trained Deep Neural Networks Using MATLAB *Senthil Kumar Jayapalan, Mohd Syahid Mohd Anuar*
2:30pm – 2:45pm	Insights For Academic Analytics *Muhammad Danial Abd Talib, Suraya Yaacob*
2:45pm – 3:00pm	Evaluation Of Malaysia's 15th General Election Prediction Models By Using Cross Validation Approaches *Izardy Amiruddin, Mohd Syahid Mohd Anuar*
3:00pm – 3:15pm	Blockchain Resilient Communication In Military: A Systematic Literature Review *Roslinda Mohamed, Hafiza Abas*
3:15pm – 3:30pm	An Exploratory Study And Impact Of Digitalisation On Malaysian Smes *Nurul Hawani Mat Tuselim, Suraya Yaacob*

Parallel Session 2

Webex Link   : https://tinyurl.com/RATIPS2021

Time   : 2:00pm-3:30pm

Chairperson   : Dr. Nurul Aini Bani

Assistant Chair   : Dr. Mohd Azri Mohd Izhar

Track   : Engineering and Technology (ENT)

Time	Paper
3:45pm – 4:00pm	Risk Assessment of Musculoskeletal Disorder Among Meter Readers for Syarikat Bekalan Air Selangor Sdn Bhd *Hazilah Mad Kaidi*
4:00pm – 4:15pm	Assessment of Delay Factors in Public Housing Projects in Selangor *Hazilah Mad Kaidi*
4:15pm – 4:30pm	User Satisfaction On Network Service Delivery By Mobile Network Operator *Rudzidatul Dziyauddin, Devendran K.Thanapalan*
4:30pm – 4:45pm	Improving The Human Factor Risks In Oil And Gas Asset Maintenance *Rudzidatul Dziyauddin, Hizam Shah Mohtar*
4:45pm – 5:00pm	Analysis of Data Including Missing Values in Mahalanobis Taguchi Systems *Farah Adibah Adnan, Khairur Rijal Jamaludin, Wan Zuki Azman Wan Muhamad*

Parallel Session 2

Webex Link   : https://tinyurl.com/RATIPS2021
Time   : 3:45pm-5:00pm
Chairperson   : Dr. Noor Hafizah Hassan
Assistant Chair : Dr. Intan Mazriza Azmi
Track   : Informatics 1

Time	Paper
3:45pm – 4:00pm	Development and Validation of a Questionnaire for digital government competency framework for Omani public sector managers *Juma AL-Mahrezi, Nur Azaliah Abu Bakar, Nilam Nur Amir Sjarif*
4:00pm – 4:15pm	Information Security Awareness Model For Government Agencies *Mardiana Abu Hassan, Noor Hafizah Hassan*
4:15pm – 4:30pm	Prioritizing Cybersecurity Management Guidelines using Analytical Hierarchy Process (AHP) Decision Technique *Norkhushaini Awang, Ganthan A/L Narayana Samy, Noor Hafizah Hassan*
4:30pm – 4:45pm	A Systematic Literature Review : Challenges in Cloud Computing Adoption for Small Medium Business in Malaysia *Muhammad Syahreen Zulkifli, Hafiza Abas*

ABSTRACT

AUGMENTED REALITY IN CULTURAL HERITAGE TOURISM: A REVIEW OF PAST STUDY

Mohd Hairul Fadli Hairul Mohd Hashim, Roslina Ibrahim

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

Augmented Reality (AR) is a complex system that combines information technology into a range of fields, including health, manufacturing, education, architecture, and the gaming industry, by superimposing virtual material on the actual environment in real time. This article provides a survey of previous research on mobile augmented reality. The goal of this study is to provide a design paradigm for point-of-interest (POI) and annotation in location-based augmented reality (LBAR) mobile applications. In cultural heritage tourism, an augmented reality annotation is a note added to an AR platform with the intent of commenting on, explaining, or modifying a historical figure, item, or location. The phrase POI refers to items that capture the attention of visitors. This strategy capable of maintaining and avoiding the obliteration of cultural heritage through time. While users may enjoy an immersive experience with this augmented reality technology, researchers continue to face challenges with location accuracy and efficiency for digital material and annotations. Indoor tracking research has already been conducted utilizing a hybrid technique that combines marker-less monitoring with the sensors found on current cellphones. This article will examine how to design an augmented reality annotation for POI and how to improve the hybrid tracking approach on an outdoor platform for cultural heritage tourism, where technical challenges such as unexpected temperature and weather conditions, as well as environmental conditions, will be encountered. The outcomes of hybrid tracking approaches can improve the efficiency of augmented reality digital material while also increasing location accuracy.

BUILDING INFORMATION MODELING LEVEL 3 EXECUTION PROCESS GUIDELINE FOR CONSTRUCTION INDUSTRY PLAYERS

Muhammad Ashiq Marecan (UTM)*; Noor Irza Mohd Zaki

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

Building information modelling (BIM) is a technology that is currently gaining momentum within the construction industry as interoperability issue is become more and more important in relative to the quality and productivity of the industry. BIM is defined as a modelling technology and associated set of processes to produce, communicate, and analyse building models throughout the entire project's lifecycle. Although there is bound of benefits that gained from the BIM application & development in cloud computing, the local construction industry still reluctant to deploy the technology in delivery its services & stagnant at some BIM maturity level. The objectives of the study include identifying the current adoption level of Building Information Modelling (BIM) Level 3 in construction industry based in Klang Valley area; followed by analyse the level of BIM adoption in Klang Valley area by using Relative Importance Index (RII) method and with respect to that a BIM Level 3 execution process guideline will be propose to assist construction industry player to successfully transfer construction practices to digital BIM-based technology. Basically this study will use quantitative research method to analyse adoption of BIM technology in construction practices by respective stakeholders in Klang Valley area. The main conclusion drawn from the study are with the proposal on BIM Execution Process Guideline, it would be served as direction to all construction industry player to easily adopt BIM technology in their work environment which will improves the construction productivity and efficiency. Also, this will ease those like to transfer from BIM Level 2 into BIM Level 3.

CURRENT SITUATION AND COUNTERMEASURES OF FOOD QUALITY AND SAFETY IN CHINA

Bingqing Zhu, Hayati Abdul Talib

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

As a pillar industry in China, the food industry has made great contributions to the national economy. However, in recent years, food quality and safety problems occur frequently, which affect consumer confidence and cause economic losses. The paper begins with the review of the current food industry in China and the demonstration of the quality and safety issues. It goes on with the relevant policies and regulations, and further to identify the underlying causes, meanwhile offering the countermeasures. The paper found that the main reasons for quality and safety problems were lack of government supervision and quality and safety awareness and put forward corresponding solutions.

DEVELOPMENT AND CHARACTERISATION OF RECYCLED POLYLACTIC ACID REINFORCED PINEAPPLE LEAF NANOCELLULOSE FILAMENT FOR 3D PRINTING APPLICATIONS

Ariff Farhan Mohd Nor, Zainudin A Rasid, Mohamad Zaki Hassan

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

The extraordinary features of nanocellulose that they enhance, including the high surface-area-to-volume ratio, the increased tensile strength, higher Young's modulus and less thermal expansion coefficient relative to its macro-size fibres, nanocellulose growth has gained significant interest over recent decades. This revolution is also applied to additive manufacturing, especially 3D printing, as the nanocellulose enhance mechanical properties, minimise warping, and improve printing directionality. On the other hand, pineapple leaves are cellulose-rich but uncommonly used for nanocellulose extraction. After fruit cultivation, pineapple leaf fibre (PALF) is regarded as waste material. Moreover, the abundance of amorphous and low-crystalline recycled plastics such as polylactic acid (PLA) had been remarked and possibly contributed to world pollution. Therefore, combinations of agro-waste natural fibre sources and recycled polymer in developing a sustainable nanocomposite filament for additive manufacturing are exciting to explore. Accordingly, the present study attempts to develop and evaluate the optimised PALF nanocellulose/recycled PLA filament. First, nanocellulose was extracted from PALF and underwent characterisation testing. Next, the nanocellulose was blended with recycled PLA to develop the filament and then printed by a 3D printer into the nanocomposites to further characterise their mechanical properties. The novelty of this study is reflected by utilising PALF as an alternative raw material for the extraction of nanocellulose and comparative characterisation study to fabricate PALF nanocellulose reinforced recycled PLA biopolymer composites. Nevertheless, technique-based novelty such as polymer and optimisation methods will be employed to enhance and control the physicomechanical properties of PALF nanocellulose/recycled PLA nanocomposite for 3D printing applications.

RECENT PROGRESS IN SELECTIVE LASER MELTING OF TITANIUM ALLOYS FOR BIOMEDICAL APPLICATIONS

Aufa Adlia Nazari, Mohamad Zaki Hassan, Zarini Ismail

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

Biomedical implant is an artificial transplanted device used to replace organs and support fractured biological hard tissue. The main goal of these biomaterial is to preserve the anatomical structure of the human body. Currently, the conventional titanium alloys commonly used in clinical application however, they still pose concerns such as decreasing osseointegration after fracture fixations. This paper presents a review of the role of additive manufacturing (AM) in providing advanced methods for fabricating metallic alloys toward Technology Readiness Level (TRL) in medical field. An overview of prostheses is discussed, followed by an examination of the potential of titanium alloys produced by AM methods. Mechanical properties and other issues relating to the functional application of these biomaterials are promptly discovered. Further, the analysis of failed bone remodelling which can lead to resorption, and advanced methods to improve osteoinductive through surface modification of the AM fabricated titanium alloys are also studied.

RECENT DEVELOPMENT OF NATURAL FIBER FOR NANOCELLULOSE EXTRACTION AND APPLICATION

Wan Nur Zulaikha Hasnul Hasrin, Mohamad Zaki Hassan

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

Natural fibre has gained its prominence among the researcher and scientist due to its potential to be used as an alternative material to various industries such as the automotive, packaging, construction and medical. This work initially discussed the natural fibre classification and overview of their chemical compositions. Further, the retting process which is a process of the fibre to be separated from the woody core was discussed. Furthermore, current technology has attracted attention in the alteration of natural fibres to form nanostructures. The method for extracting nanocellulose was mentioned. It also summarised the various methods used for the preparation of these cellulose nanofibers, including nano fibrillated cellulose (NFC), nanocrystalline cellulose (NCC) and bacterial nanocellulose (BNC). Finally, the application of this nanomaterial in biomedical was explored and a way forward of this nanocellulose technology was scrutinised.

SYSTEMATIC LITERATURE REVIEW (SLR) ON CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED) IN RESIDENTIAL AREAS

Reevan Seelen S/O Jagamogan, Hafiza Abas, Saiful Adli Ismail

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

Environmental design in residential areas addresses environmental traits of residential areas when developing plans or blueprints to build spaces that will benefit the natural, social, cultural and physical environment of residential areas. However, criminal threats that could be occurring from any corner of the environment could affect the tranquillity of the residents of any housing area. This paper aims to review the most problematic element based on the Crime Prevention through Environmental Design (CPTED) model in residential areas. There are 13 articles selected after going through three rounds of the filtering process. Overall, there are five notable elements found from the review, the elements include Geographical Juxtaposition, Surveillance, Access Control, Territoriality and Target Hardening.

Keywords: CPTED, environmental design, crime prevention, residential areas, access control, perimeter protection

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A REVIEW OF AGRICULTURE CROP DISEASES DETECTION USING DEEP LEARNING

Muhammad Solihin Kadir, Mohd Syahid Mohd Anuar

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

The fast and accurate diagnosis of crop diseases is crucial in preventing and limiting loss from the crop diseases. To achieve this goal, method such as deep learning can be used to detect crop diseases. In this study, we review and study the performance of three deep learning model to classify crop diseases. Transfer learning with full connected layer are used, to shorten and decrease the training time and images needed. The dataset used for the experiments is from online plant disease database which is Plant Village Dataset. The precision, recall, accuracy and F1-score are calculated for performance evaluation. The result show that Resnet50 perform the best compared to the other deep learning models.

***Keywords:** Crop diseases, deep learning, convolutional neural network, transfer learning, deep learning architectures*

THE EFFECTIVES STRATEGIES ON COVID-19 INFECTION PREVENTION AND CONTROL AMONG HEALTHCARE WORKERS

Nurmasitah Mohamad Nazri, Mohd Azri Mohd Izhar

Universiti Teknologi Malaysia

The health care sector is one of the fields those exposed workers to a hazardous environment. Health care workers are very vulnerable to the exposure of occupational infection that can be transmitted through inhalation, needle- stick injury, ingestion of contaminated material as well as body contact. The health care workers are the intermediaries for delivering the service thus consistent evaluation of the workplace and developing health safety practices are crucial to ensure the performance of service is not interrupted. Besides that, ensuring the safety and health of health care workers will contribute to reducing mortality, morbidity, and cost to the organization and country. The purpose of this study is to prepare the effective strategies on COVID-19 infection prevention and control by assessing the level of knowledge, awareness, and practice among health care workers at Hospital Canselor Tuanku Muhriz UKM (HCTM) during this pandemic COVID-19. Moreover, the current global fatal pandemic calls the clinical management to enhance the safety and health practices preparing for facing pandemic situations and combat the infectious disease. A cross- sectional study will be conducted at this tertiary health center to assess knowledge, awareness, and practices regarding COVID-19 infection prevention and control (IPC) among health care workers at HCTM. The secondary data from the COVID-19 HCTM management is analysed to determine the prevalence and incidence of COVID-19 infection along with questionnaires to assess knowledge, awareness, and practice on COVID-19 infection prevention control among health workers. As such, 341 feedbacks from HCWs will be sampled. Data analysis by using SPSS and the associations will be tested with the related test to evaluate relationship of the knowledge, awareness, and practice towards IPC of COVID-19 infection. In conclusion, improvement in occupational safety and health knowledge and practices are important to ensure health care workers implementing the safety measures at optimum level and occupational infection of COVID-19 among health care workers can be prevented.

DECENTRALIZED OFFLOADING VIA MULTI-AGENT DEEP REINFORCEMENT LEARNING IN VEHICULAR EDGE NETWORK

Ahmad Ariff Aizuddin Mohd Atan, Rudzidatul Akmam Dziyauddin

Universiti Teknologi Malaysia

The imminent rise of pervasive computing and Artificial Intelligence (AI) have paved ways for the advancement of smart transportation and Autonomous Vehicle (AV). Most AVs, however, are equipped with small-scale embedded systems that have limited capacities to process resource- intensive applications (e.g. navigation). In order to alleviate the processing load, an AV would alternatively offload the computational task to other vehicles that are in proximity over Vehicle-to- Vehicle (V2V) communication. Cellular Vehicle-to-Everything (C-V2X) is a technology that allows direct offloading among V2Vs in a decentralized vehicular environment. Through C-V2X, an AV will use sensing-based scheduling and reservation to choose the subchannel that is unoccupied by other AVs, as well as to alert other AVs about the chosen subchannel. Nonetheless, participating AVs might encounter a condition known as imperfect sensing in high traffic density, where an AV inadvertently accessed the subchannel occupied by another AV when the volume of participating AVs rises. This condition, in return, could cause interference and latency, therefore affecting the subsequent offload operation. It is possible for the AV to learn the interference pattern based on the affected offload operation, and predict future interference to choose the ideal subchannel afterwards. Choosing a suitable subchannel for offloading can be considered as an optimal decision-making problem and can be addressed via a machine learning method called Deep Reinforcement Learning (DRL) with Markov Games model, where each AV acts as an agent (i.e. multiple AVs = multiple agents) to learn the policy through trial-and-error until the optimal policy is achieved. Accordingly, the study investigates the adoption of Multi-Agent DRL to assess the imperfect sensing issue by facilitating cooperative learning, hence optimizing the offloading rate.

A REVIEW OF USER EXPERIENCE PATTERNS IN THE LEARNING MANAGEMENT SYSTEM CONTEXT

Mohammed Hassan Mohammed Alhejaili, Roslina Ibrahim

Universiti Teknologi Malaysia

The objective of every user-centered design effort and the critical element for any technological gadget nowadays is to provide a good user experience. User experience (UX) has grown in prominence in the era of learning management systems as a branch of human-computer interaction (HCI) that involves the interaction between product and users (LMS). To evaluate the user experience design, it is necessary to identify the acceptable or suitable variable. As with any other system, a learning management system must be simple to use and maintain. It is critical to evaluate a learning management system from the perception of the user experience. The assessment and design of user experience (UX) are crucial to the triumph of various technological goods since subjective perspectives and sentiments can differ substantially from usability-oriented objective facts when it comes to technical items. Because users are considered to be the most important stakeholders who have an effect on the system's sustainability, their sentiments regarding the system are taken into account heavily. Despite its importance, few studies have studied LMS user experience (LMSs). In e-learning, the user experience influences learners' attitudes about utilizing the learning management system (LMS). This research seeks to uncover key user experience characteristics, evaluation problems, and user experience within the LMS sphere, with a focus on educational settings. To attain these goals, a literature review was conducted, which included publications published between 2015 and 2021. The discussion focused on current difficulties, areas for further research, and promise in the subject.
Keywords: Learning management system, user experience, E- learning, evaluation

A CLOUD COMPUTING ADOPTION CHALLENGES IN FINANCIAL INSTITUTION

Nor Elsa Furzanne Mohd Kami , Ganthan Narayana Samy, Noor Hafizah Hassan, Norshaliza Kamaruddin, Sundresan Perumal, Pritheega Magalingam

Universiti Teknologi Malaysia, Universiti Sains Malaysia

ABSTRACT *Cloud based technology is constantly on the rise due to its dynamic characteristic. Especially during pandemic, the organizations have invested so much in cloud infrastructure. Moving business strategy to cloud leads to unknown threats and vulnerabilities. These threats are intertwined with the fact that businesses committed to adopt cloud technology without understanding the risks. The absence of consistency has a substantial impact on how financial institutions should execute risk assessment framework based on cloud computing environment. Thus, there is a need for a comprehensive risk assessment framework for highly regulated industries such as financial institutions, which more prone to threats due to these industries hold valuable customers' data that may bring financial gains to the attackers. Therefore, the objective of this paper is to identify and discuss about the existing cloud computing adoption challenges in financial institution to help financial institutions in assessing the risks that they face for adopting cloud computing applications. Moreover, the studies revealed that there are various cloud computing adoption challenges faced by financial institutions include a number of security issues such as breaching sensitive data, tampering with integrity of the data, the issues with ownership of the data, data recovery and loss and involves other legal issues such as regulatory and compliance. In summary, the identified adoption challenges will be used as an element for risk assessment framework for cloud computing applications in financial institutions.*

Keywords: Cloud Computing, Financial Institution, Information Security, Risk Assessment Framework

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STOCK TREND BEHAVIOR PREDICTION USING MACHINE LEARNING TECHNIQUES AND TRADING SIMULATION

Liau Sheau Chan, Nilam Nur Binti Amir Sjarif and Doris Wong Hooi Ten

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

Due to the choppy fluctuates and uncertainties in the share market, it has been a challenge for financial institution or even investors to be definite with the stock trend. The aim of the paper is to scrutinize different algorithms in data mining to identify the trend of the stock price movement. This will provide contently insights to the investor to make a precise investment and grow their portfolios. Historical price movement are extracted from financial websites. Derived attributes on Simple Moving Average (SMA) with different periods are added as an input parameter. This study proposed a combination of different features to implement with machine learning algorithms which includes k-NN, SVM and J48. The study has achieved high accuracy in stock classification, with 94.872% in k-NN, 94.855% in J48 and 85.257% in SVM. This indicates that for trend movement prediction classification, SVM is the most optimal algorithm to classify the correct trend of the stock movement, followed by k-NN and J48. However, the feature selection is also crucial to have an impactful attribute as the input parameters for better and more accurate predictive analysis. Price movement forecast was also carried out to compare between linear regression, Decision Tree, LSTM and k- NN to be used for future comparison. LSTM is the best algorithm in predicting the stock price with the least RSME indicates that it rhymes closely with the actual stock price movement.

TRANSFER LEARNING BASED NETWORK PERFORMANCE COMPARISON OF THE PRE-TRAINED DEEP NEURAL NETWORKS USING MATLAB

Senthil Kumar Jayapalan, Syahid Anuar

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia

Deep learning has grown tremendously in recent years, having a substantial impact on practically every discipline. The performance of the neural network will improve as the depth of the network is increased, but this progress will come at the cost of time and processing resources. Transfer learning allows us to transfer the knowledge of a model that has been formerly trained for a particular job to a new model that is attempting to solve a related but not identical problem. Specific layers of a pretrained model must be retrained while the others must remain unmodified in order to adapt it to a new task effectively. When faced with a challenge selecting which layers should be enabled for training and which should be frozen, this adaptation is commonly made employing fine-tuning procedures. Furthermore, similar to traditional deep neural network training, there is a typical issue with setting hyper-parameter values. All of these concerns have a substantial effect on training capabilities as well as classification performance. In this study, we examined the performance of five pre-trained networks such as SqueezeNet, GoogleNet, ShuffleNet, Darknet-53 and Inception-V3 with different Epochs, Learning Rates and Mini Batch Sizes in order to evaluate and compare the network's performance using confusion matrix. Based on the findings, Inception-V3 has achieved the highest accuracy of 96.98%, as well as other evaluation metrics including precision of 92.63%, sensitivity of 92.46%, specificity of 98.12%, and f1-score of 92.49 %, respectively.

INSIGHTS FOR ACADEMIC ANALYTICS

Muhammad Danial Abd Talib, Suraya Yaa'cob

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia (UTM),

Education plays a vital role in any civilisation; improving education thus comes priority. With tons of interest shown in analytics, it has become natural for the education world to dive into academic analytics (AA), which two primary methods are educational data mining (EDM) and learning analytics (LA). EDM and LA are used to predict students in academic difficulty, allow faculty and advisers to customise their learning path, or provide guidance tailored to unique learning needs. EDM is a method for extracting useful information that could potentially affect an organisation. LA is a method of collecting, understanding data to optimise the learning experience. This project aims to identify the business requirement specification (BRS) for the Razak Faculty of Technology and Informatics (RFTI). The BRS insight will create a foundation for academic analytics implementation at RFTI. The methodology used in the project is qualitative, with the data collected from the semi-structured interview. This project's end product is the BRS insight that can be used to apply AA at RFTI.

EVALUATION OF MALAYSIA'S 15TH GENERAL ELECTION PREDICTION MODELS BY USING CROSS VALIDATION APPROACHES

Izardy Amiruddin Syahid Anuar

Razak Faculty, Universiti Teknology Malaysia

Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia (UTM),

The 14th General Election (GE-14) outcome in Malaysia reflected how the public reacted towards numerous issues within the previous Barisan Nasional (BN) government. Somehow the voting pattern indicates BN still managed to secure a huge number of votes from parliaments within the rural area which consist majority of Malay and Bumiputera voters. However, some of the areas with the majority of Malay voters won by Pakatan Harapan (PH) due to the split of Malay popular votes between BN and another Malay based party PAS. This scenario resulted in the statistical gain for PH. BN could possibly win the previous GE-14 and the incoming GE-15 if they collaborated with PAS to avoid 3 corner fights. This paper evaluates multiple approaches of prediction models for GE- 15, based on data models developed from GE-14 results.

Keywords: Election, Politics, Malaysia, Prediction, Malay, Bumiputera, Parliament

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BLOCKCHAIN RESILIENT COMMUNICATION IN MILITARY: A SYSTEMATIC LITERATURE REVIEW

Roslinda Mohamed[1], Hafiza Abas[2] and Farahwahida Mohd. Yusof[3]

[1,2] Razak Faculty of Technology and Informatics, UTM, Kuala Lumpur, MALAYSIA.
[3] Pusat Penyelidikan Fiqh Sains dan Teknologi (CFiRST), UTM Johor Bahru, MALAYSIA

The 14th General Election (GE-14) outcome in Malaysia reflected how the public reacted towards numerous
This paper provides a systematic literature review on blockchain resilient communication in the military. The aim is to investigate the current state of blockchain technology and its applications blockchain resilient communication in military perspectives. To this end, the theoretical underpinnings of numerous research papers published in high-impact academic journals over the past decade, along with several reports from the grey literature, are included in this review to facilitate our assessment and capture the ever-expanding blockchain resilient communication in military settings. Based on a structured, systematic review and thematic content analysis of the discovered literature, we present a comprehensive classification of blockchain resilient communication applications in various domains such as IoT, privacy, and data management, and introduce key themes, trends, and emerging research areas. We also highlight the shortcomings identified in the relevant literature, in particular the limitations of blockchain in robust communication technology and how these limitations play out in the military environment.

Keywords: blockchain, military, distributed ledger technology, data management, resilient communication

AN EXPLORATORY STUDY AND IMPACT OF DIGITALISATION ON MALAYSIAN SMES

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Abstract: Industry 4.0 (I4.0) is a term for the digital revolution in industrial production emerging from the comprehensive networking and computerisation of all areas of production. The changes arising from the digital revolution in the production and value creation process are radical and pose a real challenge to organisation. Small and medium businesses need to develop strategies in good time to exploit the new possibilities of digitisation, to improve established processes and develop new business models. Small and medium enterprises are constantly forming and fighting with the obstacles that market leaders face. As a result, new challenges must be discovered, and the existing worldwide pandemic must be addressed as soon as possible. It has been recognised that not only current organisational structures will not be suitable but the vision from top management, and as a result, digital transformation in industries and leadership has evolved. Through the eyes of tomorrow's leaders, we examined the idea of digitisation and its influence on Malaysian SMEs in this study. The study also suggested that adjustments are required to be made, such as more robust and strategic planning, developing a culture of engagement, SME's readiness, and improving communication plans.

Keywords: Industry 4.0, SMEs, readiness, assessment, digitalisation, requirement engineering

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A SYSTEMATIC LITERATURE REVIEW : CHALLENGES IN CLOUD COMPUTING ADOPTION FOR SMALL MEDIUM BUSINESS IN MALAYSIA

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Cloud Computing offers variant services through the Internet that benefit Small and Medium Business (SMB). Even though cloud computing technology providers offer various cloud services, there are existing challenges in cloud computing adoption. The most crucial challenges are related to system migration and security concern subjects in cloud-based environments. Thus, this study carried out a systematic literature review since it uses a more rigorous and well-defined method to find the challenges factors of cloud computing adoption to SMB companies in Malaysia. The conclusive findings of the study suggest that cloud computing can increase business agility and values and promote a competitive business for SMBs while neutralized its challenges. This study aims to propose a cloud computing adoption based on TAM/TOE model. The results will assist Chief Information Security Officer (CISO), I.T. Manager, Chief Technology and Information Officers representing the SMBs.

Keywords: cloud computing, cloud service, security concern, small medium business, system migration.

RISK ASSESSMENT OF MUSCULOSKELETAL DISORDER AMONG METER READERS FOR SYARIKAT BEKALAN AIR SELANGOR SDN BHD

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The purpose of this study is to identify ergonomic risks towards meter readers in SYABAS. Meter readers are responsible for conducting water meter readings to generate monthly water bills for consumers. The work scope for meter readers is to acquire water consumption readings and key the data into their Personal Device Assistant (PDA). These tasks are categorized as technical tasks. They are required to acquire the reading of water consumption in large quantities in a day to generate the monthly bill of consumers in the whole of Klang Valley. Due to the large amounts of meter readings to be taken in a day, this situation potentially causes the meter readers to be afflicted with pain associated with Musculoskeletal Disorder (MSD). A study on ergonomic risk on meter readers was conducted using a questionnaire method to obtain data on the number of meter readers who have experienced problems related to MSD and the contributing factors of MSD risk towards this task. In addition, the assessment using the method Rapid Entire Body Assessment (REBA) by sampling was also conducted to identify the level of MSD risk faced by meter readers. The data collected are further analyzed to obtain appropriate improvement suggestions to decrease the risk of MSD among meter readers. Suggestions for improvements are considered based on the proper hierarchy of risk control, such as relevant costs and its practicality to be adapted by meter readers.

ASSESSMENT OF DELAY FACTORS IN PUBLIC HOUSING PROJECTS IN SELANGOR

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The construction industry is one of Malaysia's fast-growing industries that contributes to Malaysia's economic growth. However, in the fourth quarter of 2018, Department of Statistics Malaysia stated that the value of the project in the residential building sector has declined to 9.2%. This study investigates the delay in the public housing project in Selangor state. This study was conducted based on a questionnaire survey. A total of 45 causes of delay were identified and categorized into three different groups: owner-related factors, consultant-related factors, and contractor-related factors. Data collected were analyzed using the Relative Importance Index (RII) method. Results show that the contractor's most contributing delay factors are a financial problem and improper planning and scheduling of the project.

USER SATISFACTION ON NETWORK SERVICE DELIVERY BY MOBILE NETWORK OPERATOR

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*The project explores the problems which might contributes to mobile
network user's complaint where it indirectly promotes customer dissatisfaction and
loyalty. The study likewise approved a current overview instrument and investigated an extended theoretical system that draws on administration and item quality to propose extra additional issues and attributes to demonstrate view of mobile network service quality. The study in this master project reaffirmed a few key system traits normally overviewed in satisfaction studies especially in terms of network category, which are Data, Voice and SMS which will assist to decide the overall factors which contributes to customer dissatisfaction with client dependability in terms of network. Scarcely any strategies have been utilized to play out this examination. The study is performed using data collection from Telco X. M-S-Qual method is analysed to produce the variables that will be tested. Using Descriptive Analytic and Correlation Analysis method, obtain data will be analysed and the most desired type of problem will be selected and strategies are proposed to mobile network service provider on the step to overcome the problem and in the end contribute to customer satisfaction and loyalty.*

IMPROVING THE HUMAN FACTOR RISKS IN OIL AND GAS ASSET MAINTENANCE

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The purpose of this study is to provide recommendation to improve the human factors risks in oil and gas asset maintenance by assessing the awareness level among the maintenance manager/engineer and to compare with the best practices in tackling the human factor risk in aviation maintenance. This study is the result of the raising concern of human factors in oil and gas asset maintenance that potentially lead to asset breakdown or failure that caused quality and safety incidents which eventually affecting the business objectives. In this study the human factor causes in maintenance-related accident in both aviation and oil and gas are compiled and forms the basis of the assessment subsequently the awareness level on human factors among the maintenance managers and engineers in oil and gas industry were assessed and compared the gap with the aviation industry. The best practices in eliminating the human factor risks that has been imposed in the aviation industry are selected and adopted. Through this study, survey questionnaires were distributed across to both respondents in oil and gas and aviation industry. The collected data was then analysed using SPSS tools to determine the awareness level and to justify the hypothesis. Positivistic and phenomenological approach were encompassed to recommend a strategy to eliminate the human factor risks in oil and gas asset maintenance. The results of the study would be beneficial to the maintenance management to improve the maintenance processes, documentation, human skills and the reliability to achieve the business goals.

ANALYSIS OF DATA INCLUDING MISSING VALUES IN MAHALANOBIS TAGUCHI SYSTEMS

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The Mahalanobis Taguchi System (MTS), is a well-known system for diagnosis, pattern recognition and forecasting in multidimensional data. Actual analysis is frequently confronted with the issue of missing values in a data set. One or more values are missing, making model processing more complex and time consuming. If missing values are ignored in the analysis or simply replaced with zero, the results may be biassed and incorrect decisions made. Hence, this study aims to enhance Mahalanobis Taguchi Systems (MTS) by integrating random forest imputation technique (missForest). Using the enhanced MTS will smooth the pre-processing stage and extend MTS's classification capability in the presence of missing values.

DEVELOPMENT AND VALIDATION OF A QUESTIONNAIRE FOR DIGITAL GOVERNMENT COMPETENCY FRAMEWORK FOR OMANI PUBLIC SECTOR MANAGERS

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Nowadays, most governments around the world are working towards improving the efficiency, transparency of their system and providing cheaper, faster, and more democratic public services. Therefore, the governments invest in transformation projects called Digital Government or previously known as e-Government. Not only that Digital Government transforms from paper based to computer-based system, it also requires technology, people, and process along with a set of strategies. To ensure this success of the Digital Government, the government employees must be equipped with relevant digital skills that are currently not rigorously been studied. This study aimed to evaluate the face and content validity of the new instrument for digital government competency framework for Omani public sector managers. There are 7 non-expect in the IT and non- IT field participated in face validity. They rated the instrument for the relevance of each item based on a dichotomous rating of favourable or unfavourable. The feedback and comments are taking into consideration. An expert panel of eight academicians is involved in evaluating the judgmental evidence of the instrument for content validity. Items with Content Validity Index (CVI) greater than 0.80 were included in the final instrument. The final instrument contained 66 items of 5-point Likert scale multiple-choice options. The finding supports the face and content validity of this 66-item questionnaire, hence could be further researched on construct validity.

Keywords: Learning management system, user experience, E- learning, evaluation

A REVIEW OF INFORMATION SECURITY AWARENESS MODEL FOR GOVERNMENT AGENCIES

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The rapid evolution of technology has significantly changed people's everyday life. Cybercrime is vastly growing in the world of technology today. It is increasingly acknowledged that many threats to an organization's computer systems can be attributed to the behavior of computer users. For Information Security Awareness (ISA) campaigns and programs to be effective, the most successful and influential factors must be employed in the human component of the security awareness process. The purpose of this study is to identify factors influencing information security awareness in government organizations. Within this study, ISA was defined as employees' knowledge of what policies and procedures they should follow, their understanding of why they should adhere to them (their attitude), and what they do (their behavior). The initial findings is derived from the proposed model from the factors described in this model and previous researcher findings. The proposed model will assist the Government in understanding the importance of information security awareness in the organization.

Keywords: Information Security Awareness Model, ISA

PRIORITIZING CYBERSECURITY MANAGEMENT GUIDELINES USING ANALYTICAL HIERARCHY PROCESS (AHP) DECISION TECHNIQUE

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Decision theory is a set of concepts, principles, tools, and techniques that help the decision-maker deal with complex and uncertain decision-making problems. The theory of decisions provides a systematic basis for making reasonable choices in a situation of uncertainty. This research implements an Analytical Hierarchy Process (AHP) decision technique in determining the effectiveness of choices in making a decision. The proposed systematic approach also discusses detailed guidelines using Analytical Hierarchy Process (AHP) techniques to help organizations in conducting risk assessment effectively by giving priority to the proposed cybersecurity management guideline. A survey has been conducted from interviewing experts in the field of cybersecurity to get feedback on the proposed cybersecurity management guideline. From the proposed cybersecurity management guideline, the AHP decision technique is used to perform selection and prioritization in reducing the decision bias. In managing cybersecurity threats, this study proposed 3 categories of criteria namely human resource, logistical and technical aspects. This criterion is a mechanism for university policymakers in managing university networks. The research study is continued with a discussion on the use of AHP decision tools to malware, network intrusion, and web intrusion management guideline. The use of AHP as a decision tool can help to reduce decision bias and also ensure that every opinion is heard and actively build consensus among decision makers in solving problems. A collaborative decisions with multiple people can produce better results with strong commitment from decision makers

Keywords: decision technique; cybersecurity risk analysis; Analytical Hierarchy Process

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