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Virtual Conference

02ND INTERNATIONAL CONFERENCE ON
INNOVATIVE RESEARCH IN ENGINEERING AND TECHNOLOGY

15TH - 16TH JULY 2022

Organized By

Institute For Engineering Research and Publication (IFERP)

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2nd International Conference on

Innovative Research in Engineering and Technology

(ICIRET-2022)

Vietnam (Virtual Conference)

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Editorial

We cordially invite you to attend the **2nd International Conference on Innovative Research in Engineering and Technology (ICIRET -22)** on **15th–16th July 2022**.The main objective of **ICIRET -22** is to provide a platform for researchers, students, academicians as well as industrial professionals from all over the world to present their research results and development activities in relevant fields of Applied Sciences, Engineering, Technology and Management. This conference will provide opportunities for the delegates to exchange new ideas and experience face to face, to establish business or research relationship and to find global partners for future collaboration.

These proceedings collect the up-to-date, comprehensive and worldwide state-of-art knowledge on cutting edge development of academia as well as industries. All accepted papers were subjected to strict peer-reviewing by a panel of expert referees. The papers have been selected for these proceedings because of their quality and the relevance to the conference. We hope these proceedings will not only provide the readers a broad overview of the latest research results but also will provide the readers a valuable summary and reference in these fields.

The conference is supported by many universities, research institutes and colleges. Many professors played an important role in the successful holding of the conference, so we would like to take this opportunity to express our sincere gratitude and highest respects to them. They have worked very hard in reviewing papers and making valuable suggestions for the authors to improve their work. We also would like to express our gratitude to the external reviewers, for providing extra help in there view process, and to the authors for contributing their research result to the conference.

Since January 2022, the Organizing Committees have received more than 200 manuscript papers, and the papers cover all the aspects in Applied Sciences, Engineering, Technology and Management. Finally, after review, about 50 papers were included to the proceedings of **ICIRET -22.**

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of **ICIRET -22** We would like to thank the keynote and individual speakers and all participating authors for their hard work and time. We also sincerely appreciate the work by the technical program committee and all reviewers, whose contributions made this conference possible. We would like to extend our thanks to all the referees for their constructive comments on all papers; especially, we would like to thank to organizing committee for their hard work.

Acknowledgement

Rudra Bhanu Satpathy
Founder & Chief Executive Officer
Institute For Engineering Research and Publication (IFERP)

IFERP is hosting the **2nd International Conference on Innovative Research in Engineering and Technology (ICIRET -22)** this year in the month of July. The main objective of Physical Science and Technology is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The session will serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and be known as a thoughtful leader.

I express my gratitude to all my colleagues, staffs, professors, reviewers and members of organizing committee for their hearty and dedicated support to make this conference successful.

Rudra Bhanu Satpathy

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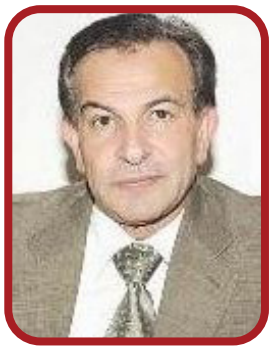
Professor, Department Of Computer Science & Engg
KLE Institute of Technology
Karnataka, India

Mr. Kevin Ashford-Rowe
Pro Vice-Chancellor, Digital Learning
Queensland University of Technology
Brisbane, Australia



Professor Marwan Al-Akaidi
Professor, Mobile & Wireless Multimedia Comms
Al Rayan Colleges
Medina, Saudi Arabia .

Dr. Justin Dauwels
Associate Professor
Technische Universiteit Delft
Netherlands.

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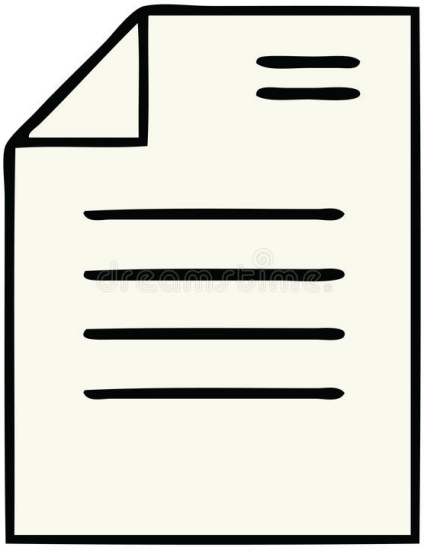

ABSTRACTS

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Imaging and Finite Element Analysis Application on Biomechanical evaluation of Bone fracture case

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Abstract— Bone fracture injury is a common problem as of various accidents or other causes. The presence of a bone fracture can easily be identified by imaging such as using a CT scan. However, the dynamic behavior of bones experiencing fractures, especially during the healing period, is rarely well known. The bone itself has the ability to regenerate itself in the context of a healing fracture. However, if the growth of the broken bone is not in the right position, it will result in inhibition of healing or the formation of imperfect bones. Various factors can cause bone disposition caused by loading factors. This paper aims to discuss how the dynamic behavior of fractures is evaluated using imaging techniques and finite element analysis. The biomechanical system evaluation is very important to be able to simulate the condition of the bones due to static loading. Several scenarios of static loading type are performed to simulate the loading propagation and its effect on the spread of stress in the fracture area. Modeling was carried out on a sample of patients who had fractures in the ischium bone due to traffic accidents. The 3-D image data from the patient were taken using a CT scan, which was then processed for the segmentation to separate the study target area from the rest of the body. The segmentation process is carried out to separate the soft tissue and leave only the bone for the simulation process. Other pre-processing such as smoothing and meshing is done to ensure that the FEA can be applied to the object. Simulations on objects are carried out which include simulations of various types of load forces and rotational forces or torque. The simulation result is a stress distribution that covers the area around the fracture and several other parts of the pelvis. From the simulation results, it can be shown that there has been a disposition and accumulation of stress around the fracture area, this can cause an influence on the position of the fracture bone junction and new bone growth in the area. However, to determine how much influence stress has on the mechanism of bone growth, further research is still needed.

Index Terms— fracture, stress, CT scan, bone, Finite element analysis.

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Early Stage of COVID-19 Spreading and Simulation Trend using The Spatiotemporal Epidemiologic Modeler (STEM), Case Study in Jakarta

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Abstract— COVID-19 virus is transmitted from human to human through splashes of saliva when the sufferer coughs, sneezes, or talks and is inhaled by the people around him. The spread of this virus started from the Chinese city of Wuhan in December 2019 which quickly spread to cities outside Wuhan including Jakarta, Indonesia. The same is in other countries, the local government in Jakarta taking some emergency decisions to minimize the virus spreading including the movement control order (MCO). This paper discusses the simulation of COVID-19 spreading in the early stage in Jakarta using a different model of disease spreading available on The Spatiotemporal Epidemiologic Modeler (STEM). The focus of this simulation is to see the effect of MCO on the COVID-19 spreading in the local area in Indonesia. The result shows that the MCO contribute to the decreasing of case number with some certain period of lag time.

Index Terms—COVID-19, movement order, simulation, vaccination.

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Prediction of Parkinson's Disease from Voice Signals Using Machine Learning

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Abstract-Parkinson's Disease (PD) is a neurological disorder related to the Central Nervous System, that influence the motion of an individual. Normally, the patients suffering from Parkinson's Disease have low voice volume with monotone quality. To automate the prediction of this neurological condition, audio signals from the UCI dataset repository had been taken. The major features like Jitter, Shimmer, Harmonic/Noise Ratio, Noise/Harmonic Ratio etc were extracted for the study. In the prior work, LSTM based model was experimented on this dataset to get an accuracy of 83%. To enhance the model accuracy, a combination of CNN and LSTM were employed in this work. From the study it was observed that the combination model exhibited a better classification accuracy of 85% when compared to the traditional machine learning models which include Support Vector Machine and Recurrent Neural Network like LSTM.

Index Terms- Machine Learning, Deep Learning, Parkinson's Disease, CNN, LSTM

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Modelling the Price Forecast for Construction Steel: A Case Study in EPC Company

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Abstract— The EPC (Engineering Procurement Construction) industry is one of the most dynamic industries. The problems faced are related to market conditions that often change, short construction periods, and fluctuations in material prices that are difficult to predict. This dynamic requires an appropriate forecasting model, which can predict the pattern of material price movements and anticipate the occurrence of fluctuations in the future. This research aims to get the best price during the project tender process. This study model the forecasting of construction iron prices in the future by considering the historical pattern of construction iron price data, the value of foreign exchange rates, and the price of billets as raw materials for construction iron. The forecasting procedure used is nonparametric, which involves several statistical tests such as cross-correlation, linearity, and error assessment. The results of this study can be a firm reference for the price value of construction iron, which makes it easier for management to determine an accurate and competitive project value.

Index Terms—construction steep, EPC company, forecasting, price.

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A Survey on 5th Generation Wireless Network Security

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Abstract— The new advanced characteristic of 5th Generation Wireless Network Systems (WNS) relent latest security challenges and requirements. In comparison to other typical cellular networks, this survey expands on a complete survey on security. The survey begins with a review on 5th Generation wireless network originality further on the advanced motivations and requirements of 5th Generation wireless security and the probable security attacks and services with its deliberation of its latest service specification in 5th Generation wireless networks will be summed up. Security services such as availability, authentication, data secrecy, privacy and key management are all used in current 5th Generation wireless security technologies and techniques. This survey provides an overview of the security risks that have arisen in recent technologies, as well as privacy concerns in the 5th Generation technology. This survey provides an in-depth examination of existing privacy-preserving systems and authentication methods for 4th and 5th generation cellular networks. We present an overview of existing surveys pertaining to 4th and 5th generation cellular networks. In addition, we use a table to explain categorization as well as a comparison of privacy-preserving techniques and authentication fourth and Fifth generation cellular networks.

Keywords—5G technology, Security, Privacy, Wireless network

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Effects of Fertilizer Application Protocols Through Fertigation on the Growth Parameters of Pre-germinated One-eye Cuttings of Sugarcane Varieties

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Abstract-The study was conducted to determine the performance of pre-germinated one-eye cuttings of three sugarcane varieties as affected by different fertilizer application through fertigation. The experiment was laid out using Strip Plot Design in three replication with sugarcane varieties for the vertical plots and fertilizer application along the horizontal plots. Analysis of variance among sugarcane varieties and fertilizer application protocols revealed significant variation in all the parameters except for the stool survival rate, plant height at 3 and 5 MAT, canopy density, stalk diameter, stalk length and weight per stalk. The sugarcane variety (Phil 2006-1899) fertilized twice a month in two weeks interval through fertigation showed the highest stool survival rate, tillers, plant height, stalk diameter, stalk length, plot weight, cane tonnage and sugar yield. The variety obtained the highest Leaf Area Index when fertilized in two split applications. Phil 2006-2289 (sugarcane variety) when fertilized at two weeks interval obtained the highest result in the number of millable stalks, and seedpieces produced. When fertilized at one week interval through fertigation, the variety had the highest canopy density.

Keywords- Fertilizer Application Protocol, Fertigation, One-eye Cuttings, Sugarcane Varieties

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Critical Review & Analysis of Eia Report of Lahore Orange Line Metro Train Project for Working Out the Eia Performance Index of Project

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Abstract- Environmental Impact Assessment (EIA) is necessary before starting any mega project. It is compulsory by PEPA Pakistan Environmental Protection Act 1997, under (Section 12). Present research study conduct EIA Performance Index for Orange line Mega train Project OLMTP. In the current era of development and advancement, time requires to make a strategy and smart evaluation of the gaps, errors, and mistakes in the previous projects to reduce the repetition chances of the same errors in the new or future projects. In this research study, we collect data from both primary and secondary sources. We use existing EIA Reports and gather data through designed Questionnaires. We pick out 43 experts, environmentalists, and related Faculty members from different Universities and consultancies. Primary Data was collected with the help of a Designed Questionnaire and Online Google Questionnaire form based on all EIA Process Stages and evaluated by sub-indices. Finally, evaluate the EIA Performance Index of OLMTP. The EIAI obtained value for OLMTP is 0.59. OLMTP shows EIAI (0.59) that reflects an average performance Index of EIA as good and effective index must show the value of at least (0.8). We conclude that the EIA Report of the Orange Line Mega train project has some flaws and gaps that need to cover and avoid these errors in future projects to meet sustainability goals. Recommendations include keeping the sustainable goals in view, during the planning and operational phases. During the construction of transportation projects, environmental consideration and green transportation keep in step ahead.

Keywords- Environmental Impact Assessment, Pakistan Environmental Protection Act 1997, PEPA, EIA Performance Index, OLMTP.

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The Development of Malunggay (Moringa oliefera) Molo Wrapper: Techno-Guide for Instruction, Community Extension, and Production

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Abstract— This experimental study was conducted to formulate a Molo Wrapper enhanced with Malunggay leaves in three (3) different treatments for three replications. The treatment formulations and composition were based on the standard and basic ingredients and procedures of making Molo Wrapper. There are three (3) levels of moringa powder added to the basic recipe. Treatment 1 (T1): one half (1/2) cup of moringa powder; Treatment 2 (T2): one (1) cup of moringa powder; and Treatment 3 (T3): two (2) cups of moringa powder. The sensory evaluation was performed using the researcher-made score sheet designed for the nine-point hedonic rating scale tests. The data were statistically analyzed. The findings revealed that T1 and T2 formulations containing a lesser amount of moringa powder have higher acceptable descriptions of like very much. Moringa powder is acceptable and can be used as an additive in developing Molo Wrapper as a new food product innovation derived from sensory analysis. Consumer panelists are more sensitive to the sensory quality that may have affected their general acceptability of the product than the experts because of the unusual color, appearance, and texture caused by Moringa powder. The developed acceptable treatment will be introduced as a techno-guide for instruction, extension services, and production.

Index Terms— Malunggay Molo Wrapper, Food Product Development, Sensory Analysis, Techno-Guide

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A Brief Survey on Detection and Tracking in Non-Overlapping Multi-Camera Network and Proposal for Future Direction

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Abstract— A smart city provides a lot of facilities that are either self-sustained or depend upon very little human intervention. However, surveillance is the one field in such a city that relies on human intervention from setting up to the actual surveillance. Modern surveillance still depends upon one human personnel, who is responsible to go through hours of footage to identify suspicious objects, track vehicles, and even identify people. This calls for an automated surveillance system, one where the machine is capable of identifying and tracking objects across the area under surveillance. Since, a surveillance system will basically consist of a network of visual sensors, in most cases cameras. For large areas of surveillance presence of non-overlapping regions come into the picture. Here we are in the process of proposing a network of cameras that can essentially operate without any human intervention even in the presence of non-overlapping areas.

Index Terms—Machine learning, Computer Vision, Edge Computing, Non-overlapping Camera Network

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Blockchain Applications in Fisheries: A Review

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Abstract-Urbanization has led to increasing fish consumption, resulting in high demand for fish and fish products. There are several challenges in the sector, including fraudulent fish supply, overfishing, unscientific handling, quality concerns, etc. The adoption of technology-enabled supply chain management could reduce the risks in this sector. In a decentralized system, data protection is a major concern and blockchain technology assures data security. Blockchain-based systems in the seafood sector could provide traceability access to the seafood for the consumers and authorities to know if the seafood consumed/sold is legal, ethical, hygienic, economic, etc. Blockchain platforms like Ethereum promote secure digital collaboration of the actors across the supply chain eliminating the intermediaries.
The literature documents a very limited number of blockchains that operate in the fisheries sector. Pacifical Atato is designed to promote and develop the sustainable and environmentally friendly skipjack and yellowfin tuna supply chains of Pacific island nations. Project Provenance Limited seeks to bring an end to the widespread violations of human rights and unsustainable fishing practices seen in the seafood industry. Fresh tuna distribution through transparent, novel supply chains is the goal of TraSeable solutions. Treum explored the investments made by fisheries companies to develop the supply chains of fisheries in the South Pacific. IBM's Food Trust traces food supplies, including farmed shrimp from India, and is affiliated with retailers like Walmart, Nestle, etc. OpenSC is a World Wildlife Fund (WWF) project that ensures ethical product sourcing and uses QR (Quick Response) code scanning and RFID (Radio Frequency Technology) to track fish.

Keywords-Blockchain, Fisheries Supply Chain, Traceability, Ethereum

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Frieze Pattern Analysis of the Eastern Cordillera Three Major Ethnic Groups Woven Native Attire

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Abstract-Mathematics is everywhere. Its beauty is seen in man's awareness of the environment. Aiming to penetrate a society's cultural component, ethnomathematics targeted indigenous weaving patterns. Ifugao (Tuwali, Kalanguya, and Ayangan) and Ga'dang (Ga'dang and Balangao) have their own individual weaving patterns which were culturally included, therefore earning their merit to be studied. Aims of knowledge collection included preserving the Eastern Cordillera's distinctive character and appreciation of mathematics and culture. The research employed a method of assessing frieze patterns in local woven attires. The Eastern Cordillera weavers employed the seven frieze group designs in their traditional clothing. The asymmetry of traditional clothing is studied using group theory and transformation geometry. The utilization of motifs that represent cultural ideas and traditions, as well as weaving style and process, favors distinct frieze and plane crystallographic groupings. The study's findings indicate the weaver's ability to create key geometric shapes without rigorous mathematical knowledge. This study directly contributes to the field of mathematical crystallography in art and cultural heritage, which uses group-theoretic approaches and tools to comprehend the mathematics in artworks from all over the globe. It adds to the expanding corpus of literature that employs symmetry to increase cultural understanding.

Keywords- Frieze Pattern, Culture, Woven Native Attires, and Symmetry

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Designing - A Novel Sensor with High Sensitivity Hydrophone for Acoustic Sound Waves

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Abstract - An optical fiber is a glass or plastic fiber that carries light along its length. Fiber optics is the overlap of applied science and engineering concerned with the design and application of optical fibers. Optical fibers are widely used in fiber-optic communications, which permits transmission over longer distances and at higher bandwidths (data rates) than other forms of communications. Fibers are used instead of metal wires because signals travel along them with less loss, and they are also immune to electromagnetic interference. A FOAS should exhibit the highest possible sensitivity, the widest possible flat frequency response, and an Omni-directional sensitivity pattern within the frequency range. The parameters studied included the mandrel geometry, the thickness of the molding coated over the fiber, and the material properties of the constituent parts of the FOAS.

Keywords–FEM, ANSYS, Mandrel, Sensitivity, FOAS

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Energy Audit of a State University in the Philippines

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Abstract- This study was conducted to perform an energy audit of a state university in the Philippines. Specifically, this study provided a detailed energy audit determining the actual status of all consuming equipment in the university's main campus consequently identifying the areas where waste energies occur to help formulate specific solutions in the form of energy conservation measures (ECMs). Results showed that the campus consumes a monthly average of 32,848.221 kW-hr per month where the largest consuming unit is the air-conditioning units (ACUs) at 54.94% followed by other loads like appliances and equipment at 38.27%. Meanwhile, the average consumption for lighting only accounts for 6.79% of the total load suggesting that more attention should be given to the ACUs to further reduce the actual consumption. If the recommended EEMs were applied, ECMs in the lighting units can give the campus savings up to 18.9% while ACU can provide a substantial amount of savings as high as 51.27%. Therefore, the energy audit did not only reveal the prevailing sources of energy wasted but more importantly, it opened opportunities for the university to increase savings while indirectly affecting the quality of work conditions.

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Experimental study of nanoparticles size distribution effect on the Mie scattering intensity

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Abstract— Mie scattering is a phenomenon that happens when an electromagnetic wave (light) is scattered by a particle the size of the particle comparable with the incident light wavelength. This non-destructive scattering technique is recently used in the various study as an alternative for measuring particle size distribution in contrast with other methods which has certain limits (i.e. destructive to the samples). The parameter observed in the Mie scattering experiment is a function of the Mie scattering intensity to the angle. This research aims to analyze the particle distribution effect of the Mie scattering phenomena experimentally via image processing technique as a preliminary study in particle size analyzer development. The nanoparticle samples that have been used to do this research are polystyrene latex with an average size of a particle of 108 nm, and Fumonisin B1 with an average size of a particle of 36.4 nm. The result of the experiment from those two types of samples was the plot of color intensity extracted from the image (photo) at varied scattering angles. The graph of scattering intensity of polystyrene sample with the average size of 108 nm has a peak value higher than sample Fumonisin B1 with an average size of 36.4 nm. Generally, the light has been scattered weaker at Fumonisin B1 samples compared to polystyrene latex nanoparticles samples.

Keywords—Mie scattering, particle size distribution, nanoparticles sample, image processing technique.

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Analysis of the Impacts of Quality Assurance and Quality Control on Construction Projects using RII method

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Abstract-Quality control and quality assurance are important parts of a quality management system, therefore quality planning, quality assurance, and quality control are all part of a quality management system in the construction sector. There are numerous approaches to put into effect for a quality management system in the construction business, which can be done at the company or project level. The motive of this work is to analyze the influence of quality control and quality assurance on building projects by using the RII method of analyses so as to know the relative importance of different factors critical to quality in construction. At the initial stage of this research a questionnaire was developed with thirty seven factors grouped into five groups 153 questionnaires were distributed to professionals and skilled workers in various construction sites belonging to different construction companies within the study area while 136 were returned, data obtained from respondents was analyzed by the use of the statistical package for social science (SPSS) after which the RII method was used to identify the relative importance of the various factors. The impact of various factors were discussed and recommendations were made. The case study area is construction sites in Kebbi state Nigeria. Therefore data obtained was statistically measured and analyzed accordingly.

Keywords- Quality Assurance, Quality Control, Construction Project

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Blockchain technology adoption in the context of Saudi Arabia: An empirical analysis for a future outlook

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Abstract— Cutting-edge technologies are leveraging businesses value chain in order to advance their competitive advantage, from this standpoint blockchain technology (BCT) gained a relative pace over the recent years demanding for more research cases. The present study aims to contribute in understanding the customers' acceptance of BCT in Saudi Arabia and tested through Technology Acceptance Model (TAM). Although empirical support for TAM varies depending on the context, it remains a popular and effective conceptual framework for analyzing aspects that contribute to technological adoption or rejection. This study was validated with the response from 740 respondents involved with BCT adoption in companies listed in Tadawul (The Saudi Stock Market) in Saudi Arabia through the Structural Equation Modeling (SEM) regression technique using AMOS software. The path analysis results revealed that a reasonable fit for the model: chi2 (2476.851), chi2 / DF (3.057), RMSEA (0.054), CFI (0.829), and TLI (0.904). Four main factors (Perceived Ease of Use, Perceived Usefulness, Attitude Towards Use, and Intention to Use) were identified as a determinant of Actual use of BCT. All factors show average variance explained greater than 45% which means that the framework will help achieve the sustainable and successful adoption of BCT. The research findings help understanding User's adoption of BCT for researchers, regulators and developers and providing supported evidence on factors contributing to the adoption of BCT in Saudi Arabia. The study is restricted to firms based in Saudi Arabia. Future study will concentrate on various countries' BCT adoption to assess for the multi-group analysis impact on the model.

Keywords—Blockchain Technology (BCT), Technology Acceptance Model (TAM), Technology Adoption, Saudi Arabia

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A Methodology for Validating Survey Questionnaires in Marketing Research

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Abstract- One of the main criticisms that the survey strategy has received is the inability to generate highly validated data in quantitative research. Therefore, marketing researchers usually rely on some qualitative methods to enhance the validity of the collected data. However, employing explorative instruments, such as interviews in the quantitative research, might contradict the positivism paradigm and the deductive approach. Hence, this paper aims to clarify a consistent methodology for validating survey questionnaires in the absence of valid justifications for using mixed methods. Indeed, the posited methodology involves a theoretical view that guides quantitative researchers to the appropriate choice of explorative instruments, but with a distance from the pragmatic stance. Finally, this paper offers theoretical and practical implications of the posited methodology.

Keywords- Quantitative, Survey, Questionnaire, Validation, Methodology, Positivism, Marketing Research

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Evaluation and comparison of the dissolution profiles of prednisone tablets available in Algeria market.

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Abstract- In this work, the dissolution profiles of two prednisone tablet marketed in Algeria have been evaluated. Prednisone is a Class 1 Biopharmaceutical Classification System (BSC) drug, the comparison of the dissolution profiles (reference and generic) is carried out. Dissolution studies have been performed according to USP and FDA (Food and Drug administration). The dissolution profiles (reference and generic) in distilled water medium are comparable. In order to prove the similarity of the two products, we carried out dissolution tests in different buffer media at different pH (pH=1,2; pH=4,5; pH=6,8).
The comparison of the dissolution profiles obtained in vitro is carried out by the statistical approach. Calculation of the difference factor $f1$ which measures the relative error between two profiles of dissolution, and the similarity factor $f2$ which can be used for the estimation the similarity of two dissolution profiles.
The coefficients of variation (CV) calculated from the values obtained in the three dissolution media and at different sampling times are less than 20%.
The dissolution percentages obtained for the two products (reference and generic) at pH=1.2 and pH=6.8 are greater than 85% after 15 minutes. At pH=4.5, the dissolution percentages of the reference are less than 85%, the calculation of the similarity factor proves to be necessary. The value of the latter is 55.92%. Therefore, we can conclude that the two products are similar.

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Modeling and Simulation of a 48-kW Off-grid Solar-PV Power System Using PVSyst

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Abstract—Economic mobilization is mainly driven by fossil-based fuels that are now dwindling and affecting the environment. Renewables are being viewed as viable options for generating energy to support development. Further, rural communities remain largely disconnected from the grid in many developing countries. The study modeled and simulated a 48-kW off-grid Solar-PV system using PVSyst to provide adequate electricity to a remote and unelectrified village in the Philippines. For a comprehensive understanding of the site, surveys and focus group discussions were conducted to determine the electricity needs and other uses of the electricity. PVSyst software was used to model and simulate the off-grid solar-PV power system suitable for the community. The 48-kW off-grid solar-PV system, consisting of 160 pieces of 300-Wp PV panels, ten sets of 4.8-kW inverters, and 160 units of 100-Ah 12-V batteries, can produce and deliver 76.69 MWh of solar energy a year, which is sufficient to meet the community's electricity needs. At a particular production of 1,432 kWh/kWp/year, the modeled solar-PV system achieved a performance ratio of 77.80%. Solar-PV is a suitable power technology that can deliver clean electricity in even the most remote locations. However, the community may be unable to afford the tariff due to the high cost of installing and maintaining an off-grid solar-PV power system. If users are charged a minimum of $ 0.26/kWh for a fully subsidized project that costs $ 210,108.98 and has an annual operating expense of $ 19,103.11, the investment will be recouped in 2.3 years. And, if $ 0.30/kWh is charged, the project can be recovered in 1.4 years with a net present value of $ 57,743.87 and a return on investment of 481.20%. Nevertheless, grants are difficult to obtain; a subsidy or loan covering 75% of the total cost is a viable option for the community. With a 75% subsidy, at $ 0.35/kWh, it will take 4.7 years for the investment to pay for itself and get a return on investment of 152.10%. This paper demonstrates the robustness of PVSyst in modeling and simulating the off-grid solar-PV power system and analyzing its economic viability.

Keywords- Off-grid, Solar-PV, Modeling, Simulation, PVSyst, Electricity Tariff, Subsidy

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Migrating data from document-oriented database to graph-oriented database

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Abstract—In data migration between different types of NoSQL database, data may not be directly transfer to the targeted database in compare to migration of data between the same type of database. This is due to the heterogeneity of storage paradigm of the NoSQL databases. For example, migrating data from a document-oriented database such as MongoDB, which stores data in Json(Java Object Notation) format to Neo4j, a graph-oriented database stores data in node, the differences among these databases' storage paradigm requires different representation of data model in the targeted graph-oriented database. This paper proposed a sequential approach to migrate data from MongoDB to Neo4j. The approach migrates MongoDB data to Neo4j and verifies the migrated data using a comparative method. The paper discusses on the migration algorithm and how complex field in MongoDB such as nested document is presented in Neo4j.

Index Terms—data migration, NoSQL database, MongoDB, Neo4j, sequential comparison

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Date Fruit Classification Model Using Deep Learning

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Abstract—Date fruit, which comprises nearly 80% of fruits produced in the Sultanate of Oman, is the leading agricultural crop in the country. Sophisticated technologies are utilized to improve the date fruit production in the country, but date sorting and grading after post-harvesting still create problems for the date cultivators. Manual date sorting is a time-consuming process and raises ambiguity about the accuracy and consistency of the grading system. This paper presents a date fruit classification system based on deep learning. It categorizes dates into four different classes based on their physical attributes. Dates fruit classification in automatic mode is challenging due to its high visual similarity, and getting better grading accuracy and performance evaluation, numerous combinations of hidden layers and epochs have been done. The performance of the model is evaluated based on its accuracy and losses. The model performance is appreciable, with a validation accuracy of 97.2%.

Index Terms—Convolutional Neural Network (CNN), Dates fruit classification, Fruits grading, Hidden layers, Image Recognition

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Analyzing the Impact of Tourism Education on the effective Resource Valorization in Lebanon

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Abstract: This research seeks to explore whether including tourism curricula in academic educational institutions promote the effective valorization of Lebanon's resources. In terms of type and focus, the study deals with investigating the impact of tourism education on resource valorization. This aims at providing perspectives on educational institutions that encourage local development via tourism education, in order to raise awareness of the importance of valorizing one's resources. While tourism education pertains to guiding and orienting students towards the tourism industry as a potential employer, this definition could be extended to encompass educating the general public, as well as potential tourists.
To further carry out this investigation, we conducted a qualitative study in gathering data from interviews, and from comparing the interview responses with previously collected secondary data. The adopted research methodology caters to interpretivist views, using an inductive approach, and action research strategy adapted to collecting and interpreting qualitative survey data. Meanwhile, the cross-sectional time horizons were conveniently chosen, and the judgmental sampling strategies were selected for recruiting specific experts for the interviews. Results validated the existence of a link between tourism education course implementation and the proper valorization of a country's resources. Through studying the relationship at hand, this link exhibited a noticeable positive relationship between tourism education curricula and effective valorization of Lebanon's resources.

Index terms: Heritage site upkeeping, Resource Valorization, Tourism education Implementation, Lebanon.

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Estimating the impact of the effective resource valorization on enhancing tourism activities in Lebanon

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Abstract: The main topic of this research is to assess the current situation of tourism in Lebanon and to identify and interpret the actual case of how the tourism industry can benefit from economic development projects in Lebanon. The main problem is that the country is incapable to properly use its ressources despite very rich potentials. This paper aims to review how Lebanon plans to review its resource management for improving tourism through effective resource valorization. Its objectives are to study the country's rich ancient history and to find out how its people perceive tourism and if they want to valorize our resources or not.
To analyze the situation, we conducted a study through a qualitative approach, which proposes a solution for an existing problem necessitating review. The selected data collection and research design points out to a multi qualitative research methodology, utilizing surveying as the main means of gathering information. Results provided a better understanding of how tourism can be sustainable in Lebanon. Sustainable tourism development in Lebanon is highly dependent on the presence of all necessary resources. This can be related to the tourist profile types that destinations need to attract.

Index terms: Valorizing cultural and natural resources, Economic development, Sustainable Tourism, Lebanon

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Sentiment Analysis of Employee Feedback Data

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Abstract— Emotional analysis is the release of information on items that help a business understand the public feelings about its product, product, or service. Employee satisfaction is an important factor for employees who need to be cared for by an organization. This study aims to create an emotional analysis model that helps to differentiate the textual reviews provided by the CMR Institute of Technology, Bangalore, based on their positive and negative emotions. Text Blob and Vader python-based sentiment analyzers are used to compare the polarity. Various methods such as Naive Bayes, SVM, Logistic Regression, Random Forest, and Decision tree are used for evaluation. Analyzing the intellectual response will help to obtain a complete review of the performance of the college.

Keywords— Sentiment analysis, NLP, Faculty feedback, Vader, Employee Satisfaction

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Predicting Faculty Research Productivity using J48 Decision Tree Algorithm

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Abstract— Research productivity is seen as a shared issue present in most academic institutions, as research output requires skills, time and patience. In the Philippines, higher education institutions are mandated to undertake research and other similar investigations in various academic areas since they are one of the key institutions who play major role in the generation and dissemination of knowledge. This study generally aimed to come up with prediction model for faculty research productivity. Specifically, it tried to seek solutions to the following: identification of necessary attributes that have significant relationship to faculty research productivity, generate computational model for predicting research productivity of faculty through J48 Decision Tree Algorithm and validate the performance of computational model using confusion matrix analysis, precision, recall and f-measure. Results showed that attributes such as paper proposal, length of service, age, teaching loads, academic ranks, designation/s, civil status, academic qualification, sex and status of appointment has vital influence to research productivity of faculty. The computational model generated had an acceptable computed accuracy, precision, recall and f-measure results. Based on the data model performance results, the system can be used and can be implemented in an actual working system.

Index Terms— J48 algorithm, Decision tree, Faculty research productivity, Mathematics of computing

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Control and Monitoring Systems of a Smart Hybrid-Powered Integrated Soil-less Farming Facility with a Fuzzy Logic-based Decision Support Module for Crop Planning to Enhance Agricultural Sustainability

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Abstract— TThis paper describes the design and operation of the following subsystems as an enhancement to the existing aquaponics greenhouse on the UTAS-Al Musanna campus in order to continually promote agricultural sustainability: 1) an aeroponics system that allows crops to grow using air mist, transforming the greenhouse into a fully integrated soil-less farming facility; 2) IoT-based smart control and monitoring systems that use Particle Photon microcontrollers connected with sensing devices and actuators to reduce operating costs and improve farm owners' access to all water quality and environmental parameters; 3) a 2.8KW micro-hybrid renewable energy (wind and solar) conversion system for continuous and stable power supply, 4) a plant health monitoring system using a Raspberry PI microcontroller interfaced with PI camera, and 5) a fuzzy logic-based crop planning decision support module implemented in MATLAB. The Particle Photon microcontrollers read and analyzed water quality indicators in the recirculating aquaculture tanks and hydroponic beds, as well as environmental parameters in the greenhouse and aeroponics grow chambers. The IoT-based microcontroller systems activated the necessary actuators when sensor readings fell outside of acceptable ranges for effective nitrification, oxidation, and photosynthesis processes. The events and data from the systems were published in the Thing Speak cloud platform for real-time monitoring and displayed in the SEAAGSAO mobile app created with MIT App Inventor. In addition, the Raspberry PI-based plant health monitoring system classified the crop's health status with 94% accuracy and sent a supervisory warning signal to the Thing Speak cloud and mobile app to alert the farmer of the condition. Furthermore, the Fuzzy logic-based decision support module for crop planning (FL-DSSCP) was able to forecast vegetable crops that are suited for cultivation and will provide a high yield for a certain season.

Index Terms- aquaponics, aeroponics, renewable energy, Internet of Things, fuzzy logic, agricultural sustainability

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Identifying Segmental Congestion Index along the Traffic Flow of Rizal Avenue in City of Manila Using Travel Time Modeling

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Abstract-The study identifies where exactly the congestion exists along Ronquillo Street, Sta Cruz up to the intersection of Aurora Boulevard and Rizal Avenue in Manila City, and its characteristics and degree by identifying the congestion index per segment. The congestion index is the ratio of delay over the free-flow travel time. The delay is the difference between the actual travel time during peak hours and free-flow travel time. The study was divided into five segments of varying lengths and utilized two traffic survey methods: the moving observer and the travel time (using multiple linear regression) and delay survey. The independent variables used in the travel time model were flow, speed, density, and road length. It suggests that the model fits the data well, and the independent variables significantly affect the dependent variable, the travel time. Model validation was done using Mean Absolute Percentage Error with a value of 15.72, categorizing the model as good in terms of forecasting. Common causes of delay along the segments were: pedestrian crossing, stopping at the red-light signal, and maneuvering vehicles in the intersection, the loading and unloading of public utility jeepneys, on-street parking and bus stations, the presence of PNR Station, the lack of boundary between northbound and southbound roads, and the defective traffic signals at the end of the segment. Results show that segment 4 (Tayuman to Cavite St.) is the most congested, while segment 3 (Bambang to Tayuman St.) is the least congested.

Index Terms- Congestion Index; Multiple Linear Regression; Mean Absolute Percentage Error

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Research of Layer thickness and selected Thermoplastic Materials and their Influence on the Surface Roughness in the Process of Fused Deposition Modeling technology

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Abstract— This paper focuses on the influence of layer thickness and five selected thermoplastic materials on the surface roughness of cuboidal sample in the process of manufacturing by Fused Deposition Modelling technology. The component, in this case, is a cuboidal specimen with the dimensions 15 mm by 15 mm by 30 mm. FDM or LPD/FFF is additive layer-based method of additive manufacturing, usually used for rapid prototyping of the prototypes and other fabricating applications which use thermoplastics materials. A geometric model is defined that takes into account the shape of the fibers of the material after application to define the theoretical roughness profile. The authors set four different layer thicknesses of the cuboid part: 0.29 mm, 0.19mm, 0.14 mm and
0.09 mm. In this experiment, authors also used five different thermoplastic filaments: ABS, ASA, HIPS, PCABS and PLA. The authors produced a total of 20 prints and the surface of each sample was measured three times in succession using a portable surface roughness tester Mitutoyo .SJ-210. The 3D printer used in the experiment was Zortrax M200. The surface roughness .in this paper is shown in .the .form of a scatter and bar graph.

Keywords - FDM, surface roughness, thermoplastic, layer thickness

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Prediction of the Sickle Cell Anaemia disease using Machine Learning Techniques

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Abstract-This research examines the utilization of machine learning to classify medical datasets, especially to guide sickle cell illness therapy. Numerous studies had shown that machine learning algorithms enhance pre-processing of medical time-series data signals and help classify medical data accurately. This study presents data for different kinds of medical learning algorithms. The first case is to identify drug dosages for individuals with Sickle Cell Disorder. The present study explores the performance and accuracy of Fuzzy Cmeans architectures. The major goal of using categorization is to help healthcare institutions give proper medicine dosage. Accuracy curves for the training and testing datasets are represented by the matching curves for each of the bars on the graphs During trials, the Fuzzy C-means delivered the best overall results with an accuracy of 99.90%.

Keywords-Machine learning, Sickle Cell Anaemia, Fuzzy C-means, healthcare, drug dosages, medical dataset.

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Designing a Framework for CareAide+: A care need hub for Persons with Disability and Senior Citizens

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Abstract— Customer satisfaction is a measurement that determines how well a company's products or services meet customer expectations. This study aims to design an architecture framework for a care need hub for Persons with Disability and Senior Citizens.
Using systems modeling for crafting architectural frameworks, the researchers used the 4+1 view model with UML to intensively describe the features of the care need hub. Quality Attributes was used to indicate how well the system would satisfy the needs of the stakeholders beyond the basic function of the system.
The design includes the functional and non-functional features of the system with their corresponding diagrams using unified modeling language in congruence with the 4+1 view model to help the developer of the system in the correct and accurate way of mapping the functionalities of the system. Architecture Models and Design Patterns are formulated and implemented to understand how the major parts of the system fit together, how messages and data flow efficiently through the system and functionalities of other structural concerns. The architecture and design patterns can speed up the development process by providing tested, proven development paradigms. The Architecture and Design Patterns meet all the requirements to develop the system.
The design is a comprehensive tool for the completion of the development of the care need hub, this would greatly help the developers of the system in crafting the correct features and data abstractions needed to build and implement the said system.

Keywords— Care Need, Framework, Person with Disability, Senior Citizen

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Distributed Generation Placement Using Voltage Stability Index and Optimal Sizing Using Adaptive Particle Swarm Optimization

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Abstract— Distribution systems are the major interface between the electricity consumer and the electrical transmission system. Requisite amount of planning is necessary for these systems to be in order as they are vast and complex. An important concern on the operation of distribution systems is its voltage stability. Placing of Distributed Generation (DGs) in the distribution system can address these concerns in a better way. The location and rating of these DGs is going to have a deep impact on the voltage profile of the system. Owing to the complexity of distribution networks, planning of these networks and placing DGs is furthermore complex. Hence, the traditional methods of distribution system operation will not be sufficient in composing DGs. Therefore, proposed method utilizes Voltage Stability Index (VSI) to find best location to place a DG and Adaptive Particle Swarm Optimization (APSO) to find the appropriate capacity of DGs optimally that minimize the active power loss of the distribution network. IEEE 33-bus and IEEE 69-bus radial distribution systems are considered to test the proposed method of DG placement. The voltage magnitudes and the power loss incurred in the system are portrayed to analyze the attainments of the newly proposed method.

Index Terms— Adaptive PSO, Distributed Generation, Optimal sizing, Voltage Stability Index.

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Predictive Hybridization Model integrating Modified Genetic Algorithm (MGA) and C4.5

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Abstract—Numerous enhancements of prediction models through hybridization and combining various machine learning to increase the prediction model's performance are still an ongoing research interest in data mining. This study proposed a modification of GA with a new crossover mating structure called Flip Multi-Sliced Average Crossover (FMSAX) operator with a rank-based selection function integrating the C4.5 algorithm. To measure the accuracy level of the C4.5, the dataset is split into 70:30 for training and testing, respectively. The simulation result showed that the proposed prediction model of the modified GA combined with the C4.5 algorithm outperformed the C4.5 prediction model, the GA having AX and roulette wheel selection function. The results showed that the prediction model obtained an accuracy value of 98.6207%, where its MAE, RMSE, Precision, Recall, and F-Measure values are 0.0066, 0.0738, 0.987, 0.986, and 0.986, respectively.

Keywords— C4.5; enhanced prediction accuracy; hybrid prediction model; MGA.

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Assessment of selected hill slopes stability

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Abstract- Mizoram is a hilly region in which landslides are a common natural hazard. Landslides are caused by excessive rainfall, cutting of hill slopes, deforestation, steep slopes, and erosion. The properties of soil have a significant impact on the gauging of the stability of slopes. On hill slopes, many multistory R.C.C. framing structures are constructed by the residence for developing hill areas. The building loads are transferred to the hill slope terrain at the foundation level, resulting in hillslope failure. As a result, the hill slope's stability under building loads must be assessed. To investigating the soil types, samples were collected from two selected slopes of Bawngkawn (S1) and Kulikawn (S2), located in the Aizawl Municipal Area, Mizoram. Three (3) soil layers were obtained at a depth of 30-60 cm from the selected slopes. According to field observations, the slope angles at sites S1 and S2 are 45°, and 60° and the slope heights are 13m and 15m, respectively. GEO5 software was used to perform Limit Equilibrium Method (L.E.M.) analysis to assess the stability of slopes in the impacted areas. The data obtained from field observation and laboratory tests were implemented during the L.E.M. analysis. It can be concluded that, based on parametric studies, the slope gradient has a consequential impact on slope stability.

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Stakeholders' Assessment on Offering Master of Engineering Programs in Romblon State University: Feasibility Study

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Abstract— The study focused on the participants' profile and their assessment on the feasibility of offering Master of Engineering programs with specialization in Agricultural and Biosystems Engineering, Civil Engineering, Electrical Engineering and Mechanical Engineering in Romblon State University. Strengths and weaknesses on viability as regards management, market demand, financial and operational aspects of the proposed program were evaluated. Using descriptive research, validated survey instrument was used to gather data from 103 participants. Results were validated in Focused Group Discussion among various stakeholders as discussants. Descriptive statistics were used to describe participants' profile, and assess viability of the proposed programs. Most participants were married males, 29 years old and below. Almost all were graduates of engineering course; licensed engineers, some were civil service eligible; majority has intent to enroll Master of Engineering. Stakeholders found that offering the proposed programs supports the university's vision and mission which considered specializations on Biosystems and Agricultural Engineering, Civil Engineering, Electrical Engineering and Mechanical Engineering. The strengths of the programs were in terms of very high viability in terms of management, market demand of graduates, financial and operational aspects. Based on the study, offering of Master of Engineering with any of the four specializations is feasible.

Index Terms—Assessment, Feasibility Study, Master of Engineering programs, SWOT analysis

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Information Technology (IT) Governance framework with Artificial Neural Network and Balance Socrecard to improve the success rate of software projects

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Abstract— IT governance enables companies to plan and manage their IT investments in order to achieve their strategic objectives. Overall goal of this paper is to discuss about an approach to improve the success rate of the software projects through Artificial Intelligence. Various governance standards are analyzed to understand the impact on software project success rates. Enterprise governance is a subset of IT governance that aids in the management of information technology resources. COBIT is a widely used methodology for developing effective enterprise IT governance. ISACA (Information Systems Audit and Control Association) stated implementation solution currently uses a sequentially ordered approach, which has raised issues. Several challenges have arisen as a result of top management's lack of commitment and misplaced solutions. Limitation on this investigation is the customized and confidential governance pattern used across various organization, hence there are very limited real time data for end-to-end analysis. Nonetheless, in combination with the agile project management paradigm, new project life-cycle solutions have evolved. Artificial Intelligence (AI) has become a key technology in recent years as a result of rising need for automated systems that run without human intervention. As a result, because it uses discrete and insufficient data to arrive at the best possible solution, the artificial neural network (ANN) method is highly useful in this case. This study found that ANN with Balance Score Card was exceptionally effective in providing the optimal solution to increase the project success rates.

Index Terms— Artificial Intelligence, Project Management, Critical success factors, management, IT governance, COBIT, Artificial neural network (ANN), Balance Scorecard

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Automatic detection of plant leaf disease using Deep learning

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Abstract- Deep learning is a branch of artificial intelligence. In recent years, with the advantages of automatic learning and feature extraction, it has been widely concerned by academic and industrial circles. It has been widely used in image and video processing, voice processing, and natural language processing. At the same time, it has also become a research hotspot in the field of agricultural plant protection, such as plant disease recognition and pest range assessment, etc. The application of deep learning in plant disease recognition can avoid the disadvantages caused by artificial selection of disease spot features, make plant disease feature extraction more objective, and improve the research efficiency and technology transformation speed. This review provides the research progress of deep learning technology in the field of crop leaf disease identification in recent years. In this paper, we present the current trends and challenges for the detection of plant leaf disease using deep learning and advanced imaging techniques. We hope that this work will be a valuable resource for researchers who study the detection of plant diseases and insect pests. At the same time, we also discussed some of the current challenges and problems that need to be resolved.

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IoT Based Industrial Parameters Monitoring System

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Abstract- This project aims to provide industrial automation using modern technology IoT. IoT means internet of things where all the physical quantities can be monitored and output devices can be controlled using internet from smart phone or PC. Here in this project we measure temperature and humidity using DHT11 sensor, flame sensor for fire detection, gas sensor for gas leakage and voltage sensor for DC voltage sensor measurement. Here we use Arduino Uno microcontroller with ESP8266-01 Wi-Fi module for internet access. A 4 channel relay board is used for the projects where buzzer, DC fan and DC pump is controlled. The Blynk app is used for IoT access. Temperature, humidity and voltage values are monitored using IoT. If gas leak is detected, buzzer and DC fan will be ON and updated on IoT. Similarly if flame is detected, buzzer and DC pump will be ON and updated on IoT. IoT screen can be viewed through web dashboard and mobile also

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Driver Monitoring and Vehicle Controlling Using IoT

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Abstract-The growth of automotive vehicles has been increasing gradually day to day, which in turn lead to the increased growth of road accidents. The numbers of these totalities that take place in India are ranked to be in the top most position in the world. The number of road deaths is high mainly in cosmopolitan and metropolitan cities. Previously, there were no technologies to lock the engine of the vehicle after sensing the alcohol intake by the driver or Drowsiness which is considered to be the main cause of accidents. There was manual checking after certain distance on the roads or the highways but still these checks were not sufficient to stop the happening of the mishaps. So, to avoid these problems, this project of alcohol detection with vehicle controlling system by locking engine is developed. The main objective of this project is to reduce road accidents, to provide automatic safety to the vehicle, driver and passengers. In India, drowsy driving is a major problem. The risk and often ruinous results of drowsy driving are alerting. Recent statistics estimate that annually 1,200 deaths and 76,000 injuries are a case of fatigue related crashes all over the world. Therefore, a technology to prevent and detect driver drowsiness is a major challenge in the field of accident-avoidance systems. Since the drowsiness presents a hazard on the road, therefore counteractive methods need to be developed to deal with its effects So here we develop an innovative system to avoid such cases. Our system would be constantly monitoring the driving force breath by placing it on the steering wheel or at place where the driver's breath is often constantly being monitored by it. So, if a driver is drunk and tries to drive the system detects alcohol presence in his/her breathe and locks the engine in order that the vehicle fails to start out. In another case if the driving force isn't drunk while he starts the vehicle and engine is started but he/she drinks while driving the sensor still detects alcohol in his breath and stops the engine in order that the car wouldn't accelerate any longer and driver can steer it to roadside. At the same time if driver is in Drowsiness condition, it is sensed by Arduino Controller and slowly stops the Vehicle and update in Blynk Server with Buzzer and Indicator alert

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Pre, Post and Symmetric Compensation techniques in optical communication systems at 5Gbps, 10Gbps and 15Gbps

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Abstract— Optical fiber is a guided media in which the information is carried in the form of light rays for high speed, more secured and reliable communication. The dispersion or chromic dispersion is property of the optical fiber which causes the loss of signal with in the fiber, due to dispersion the signals with in the fiber will spread, leads to pulse broadening of the transmitted signal causes the loss in the received signal at the receiver which leads to increase in the BER at the receiver and reduced performance of the communication system. To decrease the BER at the receiver and increase the performance of the communication system we need to compensate the dispersion of the fiber link. In this paper the Dispersion is compensated byDispersion Compensation Fiber (DCF) method using Pre, Post and Symmetric Compensation techniques for improving the performance of the optical communication system, their performancesare compared in terms of Quality factor and BER and Eye height at 5Gbps, 10Gbps and 15Gbps.

Keywords— Dispersion, Dispersion Compensation, Dispersion Compensation Fiber (DCF).

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IoT Based Smart Shopping Cart Using RFID Technology

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Abstract-In metro cities we can see you a huge rush at shopping malls on holidays and weekends. This becomes even more when there are huge offers and discounts. Now a days people purchase a variety of items and put them in the trolley. After total purchasing one should approach counter for billing purpose. By using barcode reader the cashier prepares the bill which is a time consuming process .This results in long queues at the billing counters. This project presents an idea to develop a system in shopping malls to overcome the above problem. To achieve this all products in the mall should be scanned by the barcode reader in the trolley itself and all trolleys should be equipped with a barcode reader, RFID reader and LCD screen .When one puts any product in the trolley its code will be detected automatically by the barcode reader, the item name and cost will be displayed on the LCD, thereby the cost gets added to the total bill. If we wish to remove the product from the trolley, you can take away the product and the amount of that specific product gets deducted from total amount. As an additional feature IR sensor is included to warn the user if they accidentally drop products without scanning. The main facility that the proposed model provides is the customer only needs to carry a RFID card, which is needed to be swiped in the trolley to pay the bill. When shopping is over the customer can easily pay the bill by using the RFID card in the trolley. The payment is made right there and thus avoiding the need of waiting in queue at counter and saving large amount of time. As a concern to security, the cart is provided with a servo motor for anti-theft. After completion of billing process the trolley will move into the motor, if any of the product not scanned it intimates with a buzzer sound. Hence the billing can be done in the trolley itself thereby saving a lot of time to the customers.

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Accident Detection System Using GPS & GSM

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Abstract- This project is intended to deliver a vehicle safety and accident detection system. With an increase in population, there is an increase in the number of accidents that happen every minute. These road accidents are unpredictable. There are situations where most of the accidents could not be reported properly to nearby ambulances on time. In most of the cases, there is the unavailability of emergency services which lack in providing the first aid and timely service which can lead to loss of life by some minutes. Hence, there is a need to develop a system that caters to all these problems and can effectively function to overcome the delay time caused by the medical vehicles. This can be achieved by integrating smart sensors with a microcontroller within the car that can trigger at the time of an accident. The other modules like GPS and GSM are integrated with the system to obtain the location coordinates of the accidents and sending it to registered numbers and nearby ambulance to notify them about the accident to obtain immediate help at the location.

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Raspberry Pi Based Intruder Alert System

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Abstract- In this project, an intruder detection system has been built with an implementation of convolutional neural network (CNN) using raspberry pi, gmail systems. The CNN algorithm which is stored in the cloud is implemented to basically classify input data as human being or not. By using the raspberry pi as the middleware and raspberry pi camera for image acquisition, efficient execution of the learning and classification operations are performed using higher resources that cloud computing offers. The cloud system is also programmed to alert designated users via SMTP services (email) when intruders or users are detected. Furthermore, our work is going to demonstrated that, though convolutional neural network could impose high computing demands on a processor, the input data could be obtained with low-cost modules and middleware which are of low processing power while subjecting the actual learning algorithm execution to the cloud system.

Keywords- Raspberry pi, web cam/Raspberry pi camera, python, CNN algorithm

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Automated Fluid Level Sensing and Controlling System Using IOT

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Abstract- One of the topics which is growing very popular now a day's is Fluid Level Management System in IOT. Because it has a various advantage so that people can do their work very easily and effectively. Fluid level management system refers to the monitoring and controlling the level of water inside the tank, bore-wells, river, ponds, industrial areas, and other water streams, and the liquid inside the container. The growth of Internet of Things (IOT) paved the significant attention in all fields. In this proposed system we have designed the wide ranging fluid level control and managing techniques with central controller based ARDUINO with the cloud based techniques and the internet performance with Wi-Fi modules with monitoring fluid levels on LCD as well as on App or server. To achieve the objective cloud database technique is maintained which encapsulate the periodic monitoring water level data and vicinity information. The sensor data is collected periodically that are uploaded to the cloud database where the automatic comparison analytics about the increase in water level is noted. Thus, the prior stages of rise in fluid level are automatically alerted to the public respectively.User can control the Pump using Mobile Telnet application with in the Wi-Fi range. Finally, it was observed that the level of accuracy is grown by this technique in comparison with ordinary method of monitoring and alerting system.

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Smart Electricity Monitoring and Control Using IoT

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Abstract - Internet of Things (IoT) has facilitated integration of wireless communication capabilities into sensing devices. IoT enables monitoring of many electrical, physical and environmental parameters. Electrical power consumption is one of such important parameters to be monitored. In literature, many power monitoring devices have been proposed for this purpose. But they are expensive, complex and lack adequate security measures. We have addressed these problems by proposing an implementation of a simple, compact, low-cost and secure power monitoring sensor with Wi Fi capability. Various results are presented to show the feasibility of the proposed Energy meter monitor and secure transmission of data.

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IoT Integration to Cloud Service AWS for Home Security Monitoring

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Abstract- This project explores the various features of device to cloud communication using Amazon AWS and controlling home appliance using IoT Core on a AWS. A local installation of the AWS CLI tool, and installation of the MQTT.fx testing tool. After this is set up we will program inexpensive, WiFi enabled embedded devices such as the ESP8266, ESP32, and Raspberry Pi to communicate with AWS IoT Core with MQTT. We will take advantage of free "Internet of Things" (IoT) development environments, like Mongoose OS in JavaScript, Arduino in C, Zernyth in Python, AWS FreeRTOS in C and the AWS IoT SDK in both JavaScript and Python for the Raspberry Pi to program our inexpensive WiFi devices.

The devices ESP8266 12-E or ESP32 or Raspberry Pi 3 Model B used to transmit data to AWS IoT. Alternately, we can send JSON test payloads from IoT Core directly, imitating a IoT device. This continues with programming our embedded devices to send data from the device to the AWS cloud. To transmit our data we will use the built in MQTT broker on our devices firmware, sending JSON encoded sensor data, to the AWS IoT console.

From within the IoT console we will create AWS IoT "Rules" and "Actions" to explore many of the built in AWS IoT enabled services that are integrated in the AWS IoT Core console on the AWS cloud. Creating rules-based actions to AWS services we will send, store, file, manipulate, graph and analyze our sensor data through a variety of important AWS applications. Some of these integrated applications, using these rule-based actions, are Dynamo Database, S3, SNS, Lambda, Data Pipeline, Glue, QuickSight, AWS IoT Analytics, and SageMaker. IoT is largely the fusion of devices and the web, specifically the cloud; all sending and recording data, ubiquitously and continually, everywhere. Understanding and being able to prototype and implement an end-to-end, device to cloud path communication is a much in demand career skill.

Having the skills to build a prototyping IoT solution in the cloud is already an important and highly demanded skill set for those wanting to call themselves IoT developers, and this is more true as time goes on and IoT exponentially expands as cheap connected devices become wide-spread.

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Design of an intelligent management system for agricultural greenhouse based on IOT

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Abstract- A green house is where plants such as flowers and vegetables are grown. Greenhouses warmup during the day when sun-rays penetrates through it, which heats the plant, soil and structure. Green houses help to protect crops from many diseases, particularly those that are soil borne and splash onto plants in the rain. Greenhouse effect is a natural phenomenon and beneficial to human being. Numerous farmers fail to get good profits from the greenhouse crops for the reason that they can't manage two essential factors, which determines plant growth as well as productivity. Green house temperature should not go below a certain degree, High humidity can result to crop transpiration, condensation of water vapour on various greenhouse surfaces, and water evaporation from the humid soil. To overcome such challenges, this greenhouse monitoring and control system comes to rescue. It requires a constant and periodic human monitoring to control the temperature, light intensity, soil moisture and the humidity to retain the required climatic condition that is entailed for the crop growth. It serves as protection against the climatic changes to extend the season for the growing the crops. Despite the green house being very beneficial for the farmers as it increase the yield of the crops and production rate; it causes a discomfort for the farmers as they have to keep a periodic check on the green house by making regular visits and failure to maintain the perfect climatic conditions will result in the destruction of the crops and the production rate.
Greenhouse Automation System is the technical approach in which the farmers in the rural areas will be benefited by automatic monitoring and control of greenhouse environment. It replaces the direct supervision of the human. Greenhouse is a building where plants are grown in a controlled manner. Nowadays due to urbanization and lack of land availability there is a great need to construct the Greenhouses which will be reserved mainly for growing crops. With the advancement of technology, we can control and monitor the multiple Greenhouses using IoT from the central location.
This project demonstrates the design and implementation of a various sensors for greenhouse environment monitoring and controlling. This greenhouse control system is powered by Atmega328 microcontroller it consists of temperature sensor, light sensor, soil moisture sensor,
LDR sensor, LCD display module, 12v DC fan, Bulb and pump. Temperature sensor, senses the level of temperature., if it goes high DC fans gets on and when the temperature goes low the fan gets off. Soil moisture sensor, senses the water level as the level decreases the pumps gets on. In the absence of light, the LDR sensor senses and the bulb starts glowing. By this way it will become easy to monitor and control the system.

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Emergency Rescue System Using Sensor Fusion and Machine Learning Algorithm

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Abstract- Due to rapid growth of world population, the demand for vehicles has increased tremendously, resultantly problems of traffic congestion and road accidents has also increased. The general population's life is under high risk, if any accident occurs there's a long reaction time which increments the number of deaths, therefore an automatic accident detection system must exist to overcome this situation. Statistics show that leading cause of death by injury is road accidents. There can be multiple causes of road accidents, some of them are, driver negligence due to drowsiness, driving while intoxicated, over speeding, etc. Some studies show that weather conditions can also contribute towards the severity of an accident such as fog, rain, high winds. High winds can directly influence the vehicle which may deviate the vehicle from road, or indirectly due to obstruction dangers present on the roads such as trees, walls etc. Road crashes can be seen as a collision between any on-road vehicles, obstacles or pedestrians. The survival rate of victim is highly reliant on how long an ambulance takes to reach the site of the accident and then carry the patient to the hospital. In most cases of road accidents, the injuries are not severe and the life of the victim can be rescued, however due to late arrival of the rescue teams, the injuries turn deadly. Thus, the main goal is to identify where the accident occurred, send the information to the rescue teams in considerably less time, so that they can take the necessary actions, to save the life of victim. Internet of Things (IoT) are getting popular and can be seen as a solution to improve the road safety. One effective technique to reduce traffic hazards and save precious lives could be to reduce the response time after an accident has occurred. Significant research has been carried out to address this issue and to minimize the response time following an accident. The purpose of the project is to find the vehicle where it is and locate the vehicle by means of sending a message using a system which is placed inside of vehicle system, most of the times we may not be able to find accident location because we don't know where accident will happen. When a vehicle meets with an accident immediately Vibration sensor will detect the signal, and sends it to Arduino microcontroller. Microcontroller sends the alert message basically within few seconds including the location to the police station or a rescue team. So, the police can immediately trace the location through the GPS modem after receiving the information.

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Ultrasonic Blind Stick Using GPS and GSM Based Tracking System

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Abstract- According to the WHO, about 30 million people are estimated to be permanently blind worldwide. These people are totally dependent on others. The main objective is to help visually challenged people to navigate with ease using advance technology. In this technology controlled world, where people strive to live independently, this project proposes an ultrasonic stick for blind people to help them gain personal independence. Since this is economical and not bulky, one can make use of it easily.
Our proposed project first uses ultrasonic sensor to detect obstacles without touching it using ultrasonic waves. On sensing obstacles the sensor passes this data to the Atmega 328 microcontroller. This system is also equipped with GPS and GSM based Tracking System. If the user loses his / her Blind stick, than there friend / relatives can track it easily by sending a SMS to the blind stick and after receiving SMS by blind stick, it will send its current GPS location to the user via SMS. And Water / Moisture sensor can be further added to this system to detect if there is any presence of water. Output of this sensor can be informed to the blind person by variable audio signal from Buzzer Module.

Future Scope: Light sensor can be added to this system to detect day and Night. Output of this sensor can be informed to the blind person by variable audio signal from Buzzer Module.

Keywords: Arduino UNO – Atmega 328, GPS Module, GSM Module, Ultrasonic Sensor Buzzer Module, Walking Stick

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Design of IoT Development Board Using Arduino and Its Applications

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Abstract- The Internet of Things (IoT) represents a new computing paradigmthat may soon add a new dimension to the skillset expected from awell-rounded computing professional. Engineering in ECE and CSEeducation is addressing these demands by adding IoT-centriccourses to the curriculum and including relevant content into abroad range of existing courses. This paper presents the experienceof incorporating IoT projects into an existing SystemsProgramming course. We examine several suitable hardwareplatforms, provide a sampling of student projects implementedusing the Arduino with a variety of sensors, and discuss several lessons learned that could benefit other educatorsplanning to incorporate the IoT material into their coursework.

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Home Automation using GSM

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Abstract- Electrical equipment (such as lighting systems, washing machines, and refrigerators) can be conveniently accessed and controlled by home automation.The primary motivations for home automation are to make people's lives easier, to be driven more by technology and to be successfully controlled. Bluetooth, ZigBee, Infrared Remote (IR) controllers, and Radio Frequency (RF) technology are among the technologies that can be used in home automation systems. These systems are good, but they are only effective for short distances (maximum of100meters)automation with in a specific area.
This project looks into the possibilities of 'Full Home Control,' which is the goal of Home Automation Systems in the near future. This study examines and implements home automation technology using a Global System for Mobile Communication (GSM) modem to manage household appliances such as lights, fans, and other electrical appliances using text messages transmitted via Short Message Service (SMS). This project focuses on demonstrating the GSM protocol's capability, which allows the user to operate the target system from a distance using frequency bandwidths.
Homeowners will be able to receive status updates on any household equipment they control remotely whether they are turned on or off. With the integration of GSM, the Arduino microcontroller offers the smart automated house system with the appropriate baud rate of 9600 bps.

Keywords:GSMBased,HomeAutomation,Microcontroller,SmartHome

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