



42nd World Conference on Applied Science, Engineering & Technology

Discover the Difference and Exceeding the Vision in Applied science,
Engineering & Technology Research Studies

WCASET-2022



Kuala Lumpur, Malaysia

25th - 26th November

2022

Organized by
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Editorial

We cordially invite you to attend the **42nd World Conference on Applied Science, Engineering and Technology (42nd WCASET-2022)** which will be held on **25th & 26th November, 2022** - Holiday Inn Express Kuala Lumpur City Centre, an IHG Hotel Kuala Lumpur, Malaysia . The main objective of **42nd WCASET-2022** 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 Science, Engineering and Technology. 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 their view process, and to the authors for contributing their research result to the conference.

Since September 2022, the Organizing Committees have received more than 150 manuscript papers, and the papers cover all the aspects in Electronics, Computer Science, Information Technology, Science Engineering and Technology. Finally, after review, about 61 papers were included to the proceedings of **42nd WCASET-2022**.

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of **42nd WCASET-2022**. 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.

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Message from Managing Director



Mr. Siddh Kumar Chhajer

*Managing Director & Founder
IFERP, Technoarete Groups*

On behalf of IFERP & the organizing Committee, I express my hearty gratitude to the participants, keynote speakers, delegates, reviewers and researchers.

The goal of the 42nd WCASET is to provide knowledge enrichment and innovative technical exchange between international researchers or scholars and practitioners from the academia and industries in the field of engineering, science & technology. This conference creates solutions in different ways and to share innovative ideas in the field of Science, Management, Engineering & Technology. WCASET provides a world class stage to the Researchers, Professionals, Scientists, Academicians, and students to engage in very challenging conversations, assess the current body of research and determine knowledge and capability gaps.

42nd WCASET will explore the new horizons of innovations from distinguished researchers, scientists and eminent authors in academia and industry working for the advancements in Applied Science, Engineering and Technology from all over the world. WCASET hopes to set the perfect platform for participants to establish careers as successful and globally renowned specialists in the field of science, engineering & technology.

A. Siddh Kumar Chhajer

*Managing Director & Founder
IFERP, Technoarete Groups*

Message from Chief Executive Officer



Mr. Rudra Bhanu Satpathy

*CEO & Founder
IFERP, Technoarete Groups*

IFERP is hosting the **42nd World Conference on Applied Science, Engineering and Technology** this year in month of November. The main objective of **42nd WCASET-2022** 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 sessions 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 become known as a thought leader.

I express my hearty gratitude to all my Colleagues, staffs, Professors, reviewers and members of organizing committee for their hearty and dedicated support to make this conference successful. I am also thankful to all our delegates for their pain staking effort to make this conference successful.

A handwritten signature in black ink, appearing to read 'Rudra Bhanu Satpathy'.

Rudra Bhanu Satpathy

*CEO & Founder
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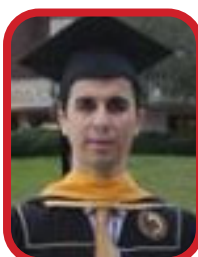
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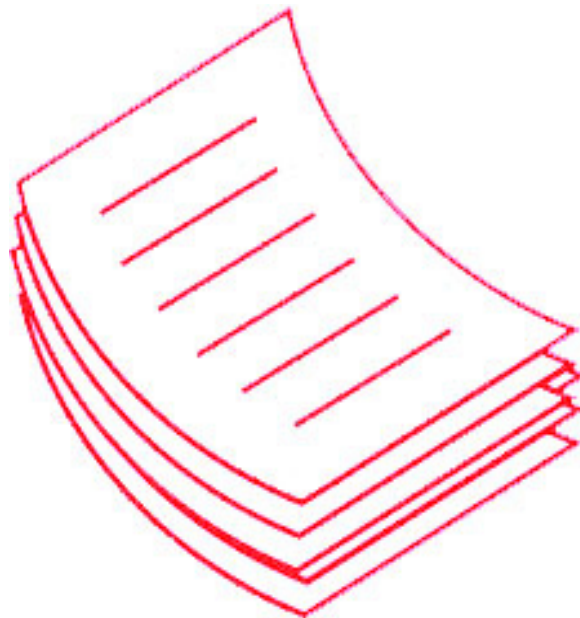
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WCASET-2022

42nd World Conference on
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Abstracts



42nd World Conference on

APPLIED SCIENCE, ENGINEERING & TECHNOLOGY

25th & 26th November 2022 @ Kuala Lumpur, Malaysia

Factors Affecting Students' Academic Performance: A Review

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Abstract

Students' Academic Performance is vital for assessing a student's standing within a university. It makes it possible for academic staff, educational administrators, and decision-makers to precisely evaluate students taking various courses throughout a semester. Additionally, it served as a cautionary tale for the students to assess their performance level and make subsequent improvements. According to official statistics in Oman, the number of students who don't graduate on time and college dropouts rise dramatically yearly. These problems hindered Oman's higher education mission. All stakeholders in Oman's higher education system must pay attention to these statistics. The main objective of our paper is to identify what factors most influence students' academic performance. Systematic literature review is used as the technique to identify the factors. This paper presents a comprehensive review of the factors affecting student academic performance. The results revealed that low entry grades, family support, accommodation, student gender, previous assessment grade, student internal assessment grade, GPA, and students' e-learning activity are the most significant factors influencing students' academic performance. This finding would be helpful for other researchers interested in academic performance issues such as modeling the predicting students' academic performance.

Index Terms

Students' Academic Performance, Higher Education, Regression, Educational Data Mining



Efficacy of pelletized Biochar from Various Agri-waste Materials on Soil Chemical Properties and Growth and Yield of Honeydew Melon (*Cucumis melo*)

Cipriano M. Tieman JR.

Institute Director, Institute of Agricultural Technology, Isabela State University Cauayan Campus

Abstract

A study the growth and productivity of tomato using different rootstock of eggplant was conducted at the experimental area of the College of Agriculture, Isabela state University, Echague Isabela. The specific objectives were to determine the compatibility of scion and rootstock combination and identify which treatment produced the highest yield. The study focused on the evaluation of the productivity of grafted tomato using different sources of rootstock such as wild eggplant, open pollinated variety (OPV) and hybrid (Casino F1). The study was laid out in a Randomized Complete Block Design. The treatments were as follows: T1– Control (Non-grafted), T2 – Grafted onto a Rootstock of wild eggplant, T3 – Grafted onto a Rootstock of Hybrid Eggplant (Casino F1), and T4 – Grafted onto a Rootstock of Open Pollinated Variety (OPV) Eggplant (Aurora Green). The height of the plants at 20, 40, 60, and 80 days after transplanting were not influenced by the different eggplant rootstocks. The grafted plants regardless of rootstock obtained the highest number of branches and marketable fruits per plant. Significantly bigger fruit diameter, heavier marketable fruits per plant and per sampling area. The non- grafted plants obtained the lowest values in all the parameters gathered. The computed yield of tomato per 1,00 square meters using different sources of eggplant showed that the rootstock of wild eggplant obtained the heaviest fruit yield with 10.82 tons as well as the highest return on investment with 432.43 percent. The used of wild eggplant rootstock is a potential cultural production modality to increase the productivity of tomato for off-season production.

Keywords

Eggplant, tomato, grafted, rootstock, scion, yield, productivity, Latex rubber tube, compatibility, off-season



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Quinacrine: A potential small molecule for the treatment of invasive ductal carcinoma in the future.

Dr. Angshuman Sarkar,

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Abstract:

BACKGROUND: Despite significant advances in research and clinical drug development, breast cancer still remains the cause of significant mortality annually. The probability of occurrence of breast cancer has increased to 1 in 8, and it continues to be the most common cancer in women worldwide. According to the World Health Organization (WHO) breast cancer alone caused almost 15% of all cancer-related deaths in women. Invasive ductal carcinoma (IDC) is the most recurrent cancer, accounting for 80% of all breast cancers worldwide. Originating from the milk duct, it eventually invades the fibrous tissue of the breast outside the duct, proliferation takes 1–2 months for each division. Quinacrine (QC), an FDA-approved small molecule, has been shown to have anti-cancer activity in numerous cancerous cell lines through diverse pathways; ultimately leading to cell death.

METHOD: In our laboratory we have investigated the mode of action of QC in MCF7 cells. We have exposed the invitro cultured cells to different concentrations of QC up on which we have checked the expression pattern of various cell cytoskeleton, apoptotic genes both at RNA as well as at the protein level by RTPCR and Western Blot analysis. We have also carried out cell morphology as well as cell apoptosis studies by various microscopic methods.

RESULTS: Our study demonstrated the modulation of cellular cytoskeleton, such as the formation of distinct filopodial and lamellipodial structures and spikes, through the regulation of small-GTPases. We also observed that QC induces a signalling cascade by inducing apoptotic cell death by increasing ROS generation and altering HSP70 expression; which presumably involves ERK regulation.

CONCLUSION: Our findings show that QC could be an attractive chemotherapeutic agent having a “shotgun” nature with potential of inducing different signalling pathways leading to apoptotic cell death. This opens new avenues for research on developing QC as an effective therapeutic agent for the treatment of invasive ductal carcinomas.



Growth Performance and Organoleptic Evaluation of Broiler Fed with Medicinal Leaf Meal Supplementation

Khrissenda May C. Ferrer

Faculty, Isabela State University-Cauayan Campus

Abstract

The effects of medicinal leaf meal on the growth performance and organoleptic qualities of broiler meat were conducted at experimental poultry house of Isabela State University, Cauayan City, Isabela from December 26, 2012 to February 6, 2013. A total of 120 three day-old broilers were randomly assigned to four dietary treatments: T1- Homemixed Ration without medicinal leaf meal, T2- Homemixed Ration with 0.50% Turmeric Leaf Meal (TLM), T3- Homemixed Ration with 0.50% Herbaka Leaf Meal (HLM), T4- Homemixed Ration with 0.50% Holy Basil Leaf Meal (HBLM). Each treatment was replicated thrice with ten birds per replication distributed in a Completely Randomized Design. Data collected were subjected to analysis of variance (ANOVA) and comparison of means was made using Least Significant Difference Test.

Insignificant weekly body weight of the birds was recorded indicating that inclusion of leaf meals did not enhance body weight of the broilers. The effect of leaf meal influences the gain in weight of the birds over the birds at fifth week of the feeding trial. The fourth week percentage rate of growth exhibited significant differences in which the birds fed with holy basil and herbaka leaf meals obtained the highest rate of growth.

Other parameters such the feed conversion ratio and efficiency, dressing percentage with or without giblets, liver and pancreas weights had comparable results.

On the sensory evaluation results showed that all the parameters used on the bird's meat characteristics regardless of the rations offered were generally accepted with a scale of "like very much".

Result arising from the feed cost analysis show that it is highly beneficial to include any of the medicinal leaf meal which is highly reasonable. The addition of medicinal leaf meal to broiler diet increase income as shown on the return above feed cost analysis.

The incorporation of medicinal leaf meal particularly herbaka leaf meal could reduced the production cost of broilers as shown in the return above feed cost, hence recommended.

Keyword

Broiler, organoleptic, medicinal leaf meal, homed-mixed, ration, feeds



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An Improved Metaheuristic Method for Unequal Facility Layout Problem

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Abstract

The problem of asset placements is widely known as the Facility Layout Planning (FLP) in the manufacturing field. The placement of assets or machines is very important for the manufacturer's planning, especially the large and highly expensive ones. A relatively small change in a machine's position can significantly affect the production flow of materials and expenses. FLP is an optimisation problem that minimises the Material Handling Cost (MHC) while sufficiently meeting the facilities' constraints or requirements and producing feasible layouts. Typically, layout planning is related to the location of facilities (e.g., machines, departments) in a plant. They are known to greatly impact the manufacturing system performance. FLPs are often uniquely designed and thus solved using specific approximate approaches. A hybrid heuristics method is developed for the unequal area FLP (UA-FLP) with fixed flow between departments. The study is considering the orientations of the departments with numerous sizes and aims to minimise the distance traveled by people, material, and other supporting tools in the safest and most effective manner. This work could be used in future as a reference for those researchers interested in exploring this challenging UA-FLP.



A Decision Support System for Benguet's Upland Vegetable Crop Prediction using Machine Learning Techniques

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Abstract:

Food security has been a long-standing problem in the Philippines, with the agricultural sector having constant issues with transporting and distributing produce, a huge mismatch between supply and demand, dealing with damages from natural calamities or outbreaks, poor crop planning and management, and other economic and political problems that have negatively affected our farmer folk. In recent times, technologies such as machine learning and decision support systems (DSS) have been helpful in mitigating these problems. This paper presents a DSS for Benguet's upland vegetable crop prediction using machine learning techniques. It will utilize these technologies to help farmers in optimizing their crop yields providing assistance to the farmers of Benguet in decision making on potential crop yield for a particular climatic scenario. Multiple linear regression algorithm was used for the prediction of crop yield and was done on a dataset that contained important commodity information per municipality for the years 2015 to 2020. Data mining techniques such as data pre-processing, data transformation, data aggregation and crop prediction were performed using Microsoft Excel, Python, and WEKA. The accuracy of prediction was evaluated through Rsquared and Root Mean Squared Error. We got an accuracy of 97.73% for the prediction algorithm.



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Predictive maintenance model for marine vessels using Machine Learning

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^[4]Badar Al Baroomi

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Abstract

The field of predictive maintenance has gained increasing interest recently for various reasons with the improvement of monitoring techniques and the increase of new methodologies and algorithms across different learning methods. There is an urgent need for the industry to detect faults accurately and in advance in the production environment, to minimize maintenance costs, prevent sudden failures and ensure optimum use of machines. Ideally, the process begins with collecting historical data from many sensors installed in different devices. In this paper, the available propulsion system data is used due to time limitation as the recording of historical data takes vast amount of time. Instead, the implementation of machine learning models using two popular algorithms are focused here. The evaluation of applied machine learning algorithms provides promising results to implement in the industry.

Index Terms

Machine learning, Marine vessels, predictive maintenance



A Proposal of Framework to Improve Sentiment Classifier Using TF-IDF for the Twitter Dataset and the Tweet Length

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Abstract:

Sentiment Analysis and Opinion Mining are relevant nowadays in many sectors to determine sentiment polarity towards an entity or its aspects. It provides a high percentage of the forecast of the triumph of something, be it events, products, organisations, persons and many more, especially the opinions retrieved from the eminent social media. Nonetheless, many of the researchers focus on the techniques themselves in the classifying methods without discussing more of the pre-processing parts for the improvement to improve the accuracy based on the corpus sizes and the tweet length or even on the word-embedding or text vectorisation before the passing the tasks to the sentiment classifiers using the myriad of machine learning/deep learning methods. Pre-processing methods, particularly in Natural Language Processing (NLP) stages such as stopwords removal, lemmatisation, stemming, and others, should be done because it is irrelevant to the Sentiment Analysis. TF-IDF is essential in text retrieval methods to emphasize the crucial words with different weightage in the documents that are undoubtedly helpful to Sentiment Analysis during Word Embedding or Text Vectorisation stages. Furthermore, the tweet length and data sizes as the corpus should identify the effects on the accuracy of the Sentiment Analysis. It is noted that currently, Twitter has allowed from 140 characters to 280 characters for the tweet length, which is interesting to discuss for the Sentiment Analysis using the Twitter dataset. In short, this research proposed several options if the corpus has fewer or fewer datasets and, on the contrary, with massive datasets.



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UiO-66-NH₂ Metal Organic Framework: an effective heterogeneous catalyst for rapid methylation of fluorinated aromatic carboxylic acids

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Abstract:

The massive use of fluorinated aromatic carboxylic acids as chemical tracers in EOR and their methylation for achieving lower limit of detection are driving the current research trend to study alternative materials for these organic reactions to overcome the disadvantage of longer reaction time in GC-EI-MS. In this context, the present article presents a study of the catalytic esterification of fluorinated aromatic carboxylic acids using methanol as solvent and UiO-66-NH₂ as catalyst. Metal-organic framework (MOF) type compounds UiO-66-NH₂ have been synthesized, using zirconium chloride as a metal precursor and 2-aminoterephthalic acid as an organic binding agent using DMF as solvent and DCM as solvent exchanger to achieve the optimum surface area. The characterization of the synthesized material was done by X-ray diffraction (XRD), Fourier Transform Infrared Spectrometry (FTIR) using KBr pellets, Field Emission Scanning electron microscopy (FESEM), and BET surface area analyzer to understand their morphology, crystallinity and porosity. The yield of the reaction was evaluated by gas chromatography coupled with Electron Ionization mass spectroscopy. The good catalytic performance was observed for different isomers of fluorinated aromatic acids showing the conversion yield greater than 90%.



A Virtual Reality Approach to Support Malaysian Sign Language Interactive Learning for Deaf-mute Children

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Abstract:

Malaysian Sign Language (MSL) is a primary sign language in Malaysia for the deaf-mute people including people with either hearing impairments or physically unable to speak. Communication is a main aspect that impacts the life of deaf-mute people. Learning MSL is very challenging as it is different from oral languages and has complex interpretation given the variability of size, shape and position of fingers or hand gestures. MSL is the only form of sign language that is recognized by the Malaysian Ministry of Education in formal education settings for deaf students. All teachings are provided visually, and students must be able to split their visual attention between signed narration and visual aids. Therefore, this paper presented a virtual reality (VR) approach to support MSL learning for deaf-mute children and their hearing parents. The VR application was assessed using a user acceptance test and pre-posttest. The findings showed that the VR application provides an innovative way for fast and efficient MSL learning compared to the conventional method.



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Measuring Travel Time Reliability Variables in A Non-Signal Highway Traffic Route

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Abstract:

Traffic congestion has become a severe scourge in highly densely populated towns in both developed and developing countries. Longer travel times, as well as a higher incidence of crushed vehicles, environmental issues, and deterioration in the quality of life, have been caused by increased demand for urban mobility and transit. Highway traffic congestion is often considered a routine occurrence; plan period accordingly. The study looks into the measure variables that influence travel time reliability (TTR). However, severe and unanticipated delays disrupted deliveries, program and activity schedules, operations, and other logistics. In other words, the study looks into the potential factors that influence travel time reliability (TTR). This study used the highway capacity manual (HCM) as a basis to assess the travel time reliability index. The authors employed Log odd ratio to identify the relationship between the buffer time index (BTI), and the planning time index (PTI) as well determine the ratio of the travel time-reliability threshold. Travel time reliability is a dependent variable in the study to measure the buffer time index (BTI) and planning time index (PTI) by the Highway capacity manual. The study revealed that the buffer time index is more fitted due to the fact that the P-value does not correspond with the (HCM)The study's findings will be useful to transportation planners, academics, and traffic engineers in their decision-making process to improve TTR. The study will also provide a better understanding of the system's capabilities, limitations, and data collection for real-time performance measurement.

Keywords:

Travel time, Reliability, Buffer time index, Planning time index, Highway Capacity Manual.



Virtual Reality Systems For Exposure Therapy

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^[2] Faculty of Science and Information Technology, Jadara University, Irbid, Jordan

Abstract:

Exposure therapy has proven to be an effective method for treating Fears, Post-traumatic Stress Disorder (PTSD), and anxiety but it quickly loses its effectiveness due to either little or too much patient participation in therapy. Because it generates imaginary, safe, and controllable environments that might heighten emotional engagement, virtual reality (VR) can aid in the improvement of extended exposure. Due to the fact that many industries have found a method to adapt this growing technology to meet their demands, demand for it has increased. This study will discuss research on how Virtual Reality Exposure Therapy (VRET) affects the accomplishment of its goals and objectives. To hasten the uptake of VR headsets, the manufacturers of goods like Head Mounted Displays (HMD) intend to keep creating more immersive content for these headsets at even better-quality levels.

Index Terms:

psychiatric treatment, virtual reality (VR), exposure therapy, PTSD, anxiety disorders.



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Development Model For The Implementation Of Information Leakage Protection Program In Public Sector Agencies

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Abstract:

The implementation of digital technology in government management process could realize the features of e-government which apply information technology as a role in the management. It bring a paradigm that highlighting the role of technology to facilitate human affairs. However, there are still shortcomings that require innovation for example in the aspect of document security which is a confidential secret for a government. The Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) saw this as a need for improvement and took the initiative to develop methods to control digital documents from the risk of leaking of secret information by establishing an MSS method managed through the OSSiD model in governance related to official government documents. Then the model of document management is developed based on the working processes of the government sector in Malaysia and comparisons with digital document management models in other places.



Detection of Chronic Obstructive Pulmonary Disease (COPD) and Pneumonia on Lung Sounds Analysis by Using Convolutional Neural Network

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^[2]*Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis, Malaysia*

Abstract:

Lung sounds analysis plays a major role in respiratory disease detection. The purpose of this research is to investigate the implementation of Convolutional Neural Network (CNN) in lung sound analysis to detect Chronic Obstructive Pulmonary Disease (COPD) and pneumonia disease. COPD is a lung obstructive disease that must be diagnosed medically based on the patient's lung sounds. In this work, lung sound is first pre-process to extract Mel Frequency Cepstral Coefficients (MFCC) features from the International Conference on Biomedical and Health Information (ICBHI) 2017 Challenge dataset. The features extracted are then used to further classify the disease using a CNN. This study used 80% of the data for training and 20% for validation testing. The CNN utilized in this study is a simple model architecture composed of four convolution layers. According to the analysis, current implementations show that the suggested structure can achieve accuracy levels of 97.7% for training and 95.8% for testing. This work shows that CNN able to detect COPD, pneumonia, healthy, and others lung diseases based on the lung sound analysis of MFCC.

Index Terms:

COPD, Pneumonia, MFCC, CNN, Lung sound



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Recycling of High Density Polyethylene Plastics (HDPE) Reinforced with Coconut Fibers for Floor Tiles

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^{[1][2][3]} Faculty of Engineering, Technology & Built Environment, UCSI University

Abstract:

The increasing amount of plastic waste and biomass waste has become a growing global environmental problem, and combining the two to form composite materials is one way to solve the problem. HDPE (High Density Polyethylene) is a common material in a variety of industries, including packaging and automobiles. HDPE, on the other hand, has a number of disadvantages, including not biodegradable and of poor thermal stability at high temperatures. HDPE may be recycled by employing it in composites as a matrix. Meanwhile, natural fiber may be made from biomass waste, which is a low-cost resource that can be used to substitute scarce resources. In this study, HDPE is mixed with fibers from coconut shells to make a bio-composite material, which is then tested for mechanical properties (Tensile test, flexural test and impact test), hardness test, water absorption test and thermal insulating test. The purpose of this study is to confirm the suitability of coconut fiber reinforced HDPE composites for the manufacture of floor tiles and to confirm the scope of their application. Pure HDPE, and blends of 5%, 10%, 15% and 20% are tested. The results have proven that the material is suitable for exterior floor tiles, such as tile paths in parks and tiles in public places, due to the good mechanical properties, thermal insulation and low water absorption rate of the composite.

Index Terms:

Coconut fiber, composite, floor tiles, HDPE



Preparation and characterization of composited Zinc Oxide (ZnO)/ Tin Oxide (SnO₂) nanostructure film-based humidity sensor by electrospraying method

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^{[1][2][3][4][5][6][7]} Universiti Teknologi MARA (UiTM) Shah Alam, Malaysia

Abstract:

This paper studies the fabrication of zinc oxide/tin oxide (ZnO/SnO₂) nanostructure in humidity sensors. Metal oxides such as SnO₂ and ZnO are suitable to produce high quality humidity sensors. Besides, ZnO and SnO₂ are the ideal heterojunction because of their wide band gap, high sensitivity and high thermal stability. The SnO₂/ZnO nanostructure was grown on ITO glass using electrospraying. The SnO₂/ZnO composite nanostructures were studied by varying different parameters including the ZnO, SnO₂ and SnO₂/ZnO composition and different Sol concentration (0.1,0.5,0.7mol) annealing at 500°C by using electrospraying method. The humidity sensing on sensitivity, response and recovery time were studied in this research. The result showed that the increasing of Sol concentration led to small the size of crystallite and diameter. When Sol concentration increased, the conductivity of the films was significantly decreased. The sensitivity of the humidity sensor decreasing when the Sol concentration increased. The sensitivity plots at different humidity levels in revealed the excellent performance of 0.1 mol with 7.46 ratio.

Index Terms:

ZnO/SnO₂, solution concentration, electrospraying, humidity sensor



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Structural and Humidity sensing Characteristics of Zinc Oxide Nanostructure on PET substrate Prepared by Sol-Gel Immersion Method Immersed at Different Times

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Abstract:

In this paper, ZnO nanostructure based humidity sensor using sol gel immersion method on the Al-doped ZnO seed layer PET substrate were examined to gain insight into the behaviour and design of high-performing humidity sensors. The parameter that was used during this research was different immersion time which is 30 min, 2 hour and 4 hour. From the results, it shows that the average diameter of ZnO nanostructure obtained by using Field emission scanning electron microscopy (FESEM) were 99nm, 106nm and 111nm respectively. It was also revealed that through X-Ray diffractometer (XRD), all samples were able to have (002) peak, which indicate that there are a high degree of crystallinity in each of the samples. In the humidity sensor performance, it shows that 4 hour ZnO nanostructure have a better performance compare to 30 min ZnO nanostructure and 2 hour ZnO nanostructure with sensitivity ratio were 68.4, 43.5 and 93.4 respectively.

Keywords:

Humidity Sensor, PET Substrate, Sol-Gel Immersion Method, ZnO Nanostructure



Studies on Effects of Unexplored Organic Traditional Leather Waste as Organic Fertilizer on Quality and Yield of Grapes

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^[1] Department of Physics, Agasti Arts, Commerce & Dadasaheb Rupwate Science College, Akole, Maharashtra, India

Abstract:

Present study has carried out to understand the effects of organic traditional leather waste as an organic fertilizer on soil properties, yield and quality of grapes. Fertilizer has applied by spray, drenching, and sub soil application on grapes with respect to various concentrations and intervals (e.g. A1 & A2: 0.5 ppm - 15 DIAP & 30 DIAP, 1 ppm - 15 DIAP & 30 DIAP, 2 ppm - 15 DIAP & 30 DIAP, 3 ppm - 15 DIAP & 30 DIAP, 4 ppm - 15 DIAP & 30 DIAP, 5 ppm - 15 DIAP & 30 DIAP. B: 100 g/ plant, 200 g/ plant, 300 g/ plant, 300 g/ plant, 400 g/ plant, 500 g/ plant, 600 g/ plant and Control). Physico-chemical parameters of organic fertilizer as well as pre and post treatment soil samples have analyzed. Chlorophyll, protein and reducing sugars content in grapes leaves, along with, morphological and visual parameters like cane diameter, internodal distance, number of bunches per plant, berry colour, scars, disease infection, insect damage and quality parameters like number of berries per bunch, bunch weight, 50 berry weight, berry diameter, berry length, skin thickness, pedicel thickness, determination of acidity in berries, dry matter content has determined and yield per hector has calculated. Data has analyzed in SPSS software. With respect to results, present study concluded that this unexplored organic traditional leather waste has huge potential and effectively worked as organic fertilizer which increases quality and yield of grapes and improved soil fertility as well.

Keywords:

soil properties; quality parameters; grapes growers; Pimpalgaon Baswant; field experiments



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Boosting accuracy of Supervised Algorithm with the Introduction of Helper Constant

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^[1] *Software Architect, Bosch Global Software Technologies, Tamil Nadu, India*

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Abstract:

If we take any machine learning algorithm the success of it is based on the accuracy. If the algorithm accuracy deprives due to the increase in the size of the feature vector then Boosting techniques help the algorithms (in our case it is Regression algorithms) to maintain or improve the accuracy. In this paper we deal with the supervised algorithms and the accuracy of the supervised algorithms is improved with the introduction of wrapper constants so that the accuracy is improved with the large dataset as well as with more number of features.

Key-terms:

Supervised learning, Boosting, Feature vector space.



Solar Power Generation System Model Integrated with Network Connected Battery Electricity

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Abstract:

Utilization of solar energy as clean and renewable energy through the solar power generation system connected to the grid general electricity for example the State Electricity Company has become great concern for previous researchers. Newest update This grid general electricity system is integrated with an energy storage system for maintain the stability and reliability of the power system. This paper presents the grid general electricity model which is more stable, effective, cheap and reliable than the system existing areas that support environmental conservation areas.

Method which used in this paper is to conduct a literature review to study and know the development of existing systems. The next step is performs optimal topological design, modeling, simulation and analysis for the integrated the grid general electricity system with a battery-like energy storage system. The power converter between the battery and the power grid is a 2 way system developing a new system based coordinating control strategy intelligent fuzzy logic controller in the the grid general electricity system work system developed in comparison with existing models there is.

Key words:

The Grid General Electricity, Battery, Electricity Network



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Suitability of drone-dispersal pollination in enhancing the fruiting characteristics in date palms

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^[1]Post Doctoral Research Scholar, Lincoln University College, Malaysia

^[2]Professor, Lincoln University College, Malaysia

Abstract:

As the date palms are dioecious, pollen must be moved from male to female palms in order to produce a harvest that is profitable. The requirement for artificial cross-pollination for this species to survive was recognized even in very early times. This has conventionally been accomplished by planting male flower spikelets on female inflorescences manually by climbing each palm tree. This procedure was found to be labor-intensive, tiresome, and time-consuming. Some regions of the world experimented with mechanical pollination techniques as a result of changes in agricultural practices during the modern era. However, due to technological, environmental, or economic difficulties, machine pollination of date palms has not gained widespread acceptance. Recently, agricultural drones are employed to pollinate date palms quickly, safely, cheaply, and with minimal danger of injury. But this technology is in its early stages of development and has not been adopted by the general public for use. The method's impact analysis has not yet been done because this technology is still in its infancy. This paper presents the results of an experimental drone dispersal pollination study on three Omani date palm cultivars namely, Al Naghal, Al Khanezi and Al Kasab. Suitability of this technique is examined by contrasting the fruit yield characteristics with those of the widely used traditional method and the less common machine/hand pollination methods. A unique spraying mechanism is proposed in order to overcome the drawbacks of aerial pollination and increase its effectiveness.



Construction and Corporate Social Responsibility (CCSR) in the Philippines: Framework Standard Formulation for Construction Firms

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Mapúa University, Philippines

Abstract:

Awareness in Construction and Corporate Social Responsibility (CCSR), widely known as Corporate Social Responsibility (CSR), is rising in the construction sector because of the “Build, Build, Build” program of the Philippine government that aims to spend 8 to 9 trillion pesos in building infrastructure from year 2017 to 2022 . In order to bridge the gap of social transformation, this paper reports on the results of a series of interviews and surveys with experts in construction and the companies they work in. Construction industry gives an impression that there’s no definite standard when it comes to social responsibility. The paper discusses the findings of this study, with a particular focus on making a CCSR framework specifically for construction firms in the Philippines based on International Organization for Standardization (ISO) 26000, and implementing rules and regulations in the Philippines. The results produce a formulation of framework standard of CCSR in the Philippines and would be appropriate to encourage the construction firms to use the framework as a guide to implement the CSR in construction industry.

Keywords:

construction and corporate social responsibility (CCSR) standards, construction firms in the Philippines, level of commitment, initiatives, mathematical model



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A Simple Way to Increase the Performance of the 3-phase Induction Motor

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Abstract

The three-phase induction motor is the most used electric motor in the industry due to its robust construction and is easy to use. However, the motor performs inferior to other types of electric motors. Various methods have been developed to improve the performance of three-phase induction motors, including the use of a three-phase induction motor in a single-phase system, on enhancing the ferromagnetic material quality, and increasing the number of motor winding phases from three to twelve phases, but all of these methods require considerable additional costs. Therefore, this study aims to improve motor performance without high additional cost by developing the motor winding design. This study focused on the 3-phase induction motor with 24 slots. The winding designed for the motor was made up of 2 layers of 3-phase winding. The winding into the second layer is shifted by approximately 60 degrees from the first layer. Thus, the winding in the motor is designed as a 6-phase symmetrical winding. The performance of the designed motor was compared with that of conventional three-phase induction motors of the same design as the stator, rotor and nominal current. The results of this study indicated that the designed motor performed better than a conventional 3-phase induction motor.

Index Terms

3-phase induction motor, 6 windings design, double layer winding, a simple method.



How Perceived Trust Mediates Indonesian Lenders' Intention to Use P2P Lending Platform

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Abstract

In 2020, P2P lending dominated 50% of the financial technology industry in Indonesia. The fast growth and development of the P2P lending industry is believed to be driven by the need of borrowing from the unbankable population and the ease of requirements when compared to traditional financial institutions. But when compared to penetration of Internet users and Fintech users, the penetration of lenders in P2P lending platforms is still considered low whereas Otoritas Jasa Keuangan (OJK) recorded the adoption for lenders accounts was valued below 1% in 2020 which is highly believed to be influenced by the risks considerations of the industry and the negative publications that impact public trust towards P2P. Using Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), this study aims to analyze key factors that affect lenders' behavioural intention to adopt lending on the P2P lending platform with perceived trust as the intervening variable. The population in this research focuses on lenders of P2P lending platforms in the DKI Jakarta and Banten area, and a sample of 138 lenders in P2P lending were analyzed using SmartPLS 3.0 for the hypotheses testing. The hypotheses results show an R² value of perceived trust of 0.923 and an R² value of behavioural intention of 0.882. The behavioural intention for lenders to use the P2P lending platform was proven to be influenced by performance expectancy, social influence, facilitating conditions, interest rate attractiveness, and perceived risk with perceived trust as the intervening variable. Meanwhile, effort expectancy intervened by perceived trust did not affect the behavioural intention for lenders to use P2P lending which is believed due to the familiarity of Indonesian users with technology and the Internet and the low level of complexity of the P2P lending application flow. This study concludes that it is crucial for the P2P lending platforms to increase public trust by utilizing public figures and the lenders' social environment to increase their confidence and trust in using the platform, evaluate interest rates regularly that could benefit the lenders, and minimize the risks of overdue payments to establish a foundation where P2P lending prioritizes the needs of their users. Additionally, regulations by governments and regulators were believed to be influential in protecting the lenders' rights and help in obtaining the trust of the lenders to attract them to P2P lending.



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Regression Control Charts-A Survey

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Abstract

Statistical quality control is a method and graphical procedure that plays a vital role in monitoring and controlling the process for the targeted quality. Control charts can be viewed in two different ways: standard Shewhart control charts with their variations, and control charts that are influenced by interrelated independent variables for the process shift. The combination of conventional control charts and regression analysis is called regression control charts. Regression control charts assist in lowering overall process variability, inspection, and rejection costs, also monitoring and projecting performance ranges. This Paper considers 43 articles on various regression control charts during 2010-2021 for the survey. The widespread construction of regression control charts in general and the research carried out in the construction of regression control charts in the presence of multicollinearity, in particular, is discussed. The charts are categorized based on linear, non-linear, and generalized regression models. This survey aims to aid researchers in their understanding of various features of regression control charts. This is crucial because numerous researchers approach issues in a variety of ways, making it clear that there are various points of view.

Index Terms

Control Chart, Literature Review, Multicollinearity, Regression Control Chart, Statistical Process Control



Hydrodynamic Model of Flood Flow Around Pamarayan Weir in Ciujung River, Banten Province

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Abstract

Pamarayan Weir is a sluice weir located in Ciujung River, Banten Province. It is one of the most important weir of Ciujung River as it serves for irrigation of 21,350 ha of rice fields. The capacity of Pamarayan weir is reduced not only for irrigation but also for flood control. Furthermore, the weir safety is then trend to be threatened during the rainy season as the peak discharge of flood hydrograph is trend to increase and the weir capacity is trend to decrease. The purpose of this study to assess the potential sedimentation distribution during the dry season and bed erosion pattern around the weir. The assessment is done based on the flow pattern generated by each of the flow scheme using mathematical model HEC-RAS 6.2 of 2D Unsteady Flow. The dry season scheme is assessed using dependable flow of Q90%. Meanwhile, the flood flow assessment scheme is done using Q50 years of return period. Current simulation results show that the flow velocity on the right side of the weir is higher than on the left side. The flow velocity on the right side shows the occurrence of river bank scouring and on the left side the accumulation of sediment.



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Analysing the need of big data owners to regularly update security measures

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Abstract

The rise in big data has led to the need for more systems that can store and manage these enormous volumes of data. The architectures for Big Data and Cloud Computing also require being highly secured. However, using such big data management technologies can negatively affect customers' data security. This article intends to draw attention to the security issues with big data and the cloud, along with the most recent data on the frequency of vulnerabilities that threaten these networks and prohibit them from operating securely. It also analyses the big data owner needs using the analysis of a collection of data to highlight the significance of big data security. The article also discusses how to raise the Hadoop big data administration platform's security.

Index Terms

Big data, security, vulnerabilities, cloud computing, Hadoop



Geotechnical Properties of Omani Sabkha Using Cement-marble Stabilization Technique

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Abstract:

Sabkha is used to define salt-encrusted flats which underlie of sand, silt or clay soil. It is founded all over the world especially in arid and hot areas that characterized by substantial paucity of precipitation compared to the evaporation rate. Nearly 10% of total land surface area covered by various type of sabkha. However, sabkha soil has a low shear strength and low compressibility. Hence World has witnessed an enormous amount of new development in various sectors. Soil improvement techniques are extremely required to enhance physical and mechanical properties of sabkha. Cement stabilization is producing soil-cement with highly compacted mixture. Annual estimations revealed that approximately 1.35 billion tons of CO₂ in 2010 (nearly 7%) is emitted from OPC production. Consequently, there are major changes in the environment and ecological stability. These challenges required scientific attention to safe it. Marble waste is a challenge that need sufficient and argent attention. Roughly, there are about 500 million tons of marble products worldwide. During process of marble cutting, grinding, and polishing, approximately 20-30 % of the marble blocks becomes a waste. This research is aimed to get rid of this waste material by utilizing it for beneficial purpose. Sabkha sample is collected from Al-Azaiba- Muscat, Sultanate of Oman is used to be stabilized using marble slurry powder from Omani deposits. Soil sample well be treated by two processes: cement and cement-marble waste with various proportion. Sabkha-cement (SB-C) and Sabkha-cement-marble (SB-CM) are tested at 0, 2.5, 5, 7.5 and 10% of sabkha dry weight. Cement-Marble doses of 0, 10, 20, 30 and 100% are examined. Physical and chemical properties are identified in addition to unconfined compressive strength UCS test.

Index Terms:

salt-encrusted flats, Marble Slurry, soil stabilization, Alternative Treatment.



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Integrated Waste Bank Application for Zero Waste Program

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Abstract:

The Sorong Raya Waste Bank was established in 2014 and discloses to the government, the general public, and the private sector in environmental conservation programs. The waste bank accepts organic and inorganic types of waste by applying the 3R model (reduce, reuse, recycle). The expected output from the implementation of the waste bank program is to provide added economic value for waste. This program also embodies the concept of implementing a people's economy in a straightforward manner. Currently the Waste Bank has a Management Information System to manage operational and business data as well as handle services through integration with the Waste Mobile Banking Application for Customers. Previously there were several complaints related to the website from users, based on this this research used the Webqual 4.0 methodology to analyze website quality instruments based on user satisfaction. The results of the analysis of the waste bank management information system website is that there is a relationship between Usability Quality (UQ) and User Satisfaction which has a sig value of $0.034 < 0.05$, which means the second variable has a significant relationship. Next is the relationship between Information Quality (IQ) and User Satisfaction with a sig value of $0.836 > 0.05$ which is stated to have an insignificant relationship. Furthermore, Service Interaction Quality (SQ) with a value of User Satisfaction sig $0.004 < 0.05$ means that it has a significant relationship. Meanwhile, Visual Quality (VQ) with User Satisfaction with a sig value of $0.150 > 0.05$ means that there is no significant relationship. For instruments that do not have a significant relationship with user satisfaction because the information displayed is not easily accessible, the layout of the presentation of information must also be appropriate so that it can be managed by users. The report font size must be adjusted to the website display so that users can read the data efficiently, and the colors used must also match the company logo.

Keywords:

zero waste; webqual; management information System; website quality; public service



Experimental Investigation of Insulator Dielectric Strength of Transmission Tower in Rocky Areas

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Abstract

Lightning is a natural phenomenon that destroys a power line. According to the Sumatra load Distribution and Control Center (Sumatra P3B), the intensity the number of lightning strikes on a 150 kV transmission line was very high in Indonesia, reaching 66%. As a result, the isokeraunik level on the 150 kV transmission line in that area is at 174 days/year, and the flashover occurrence rate in its ceramic insulators is 82% in the hilly area, 16 % in the rice fields, and 2% in the desserts/pastures. The investigation results showed correlations between the occurrence of back-flashover and contaminants of insulators. Furthermore, the results of the experiment show that the insulator contaminated with moss has a lower dielectric strength as the rate of breakdown voltage in the test voltage 78.728 kV is 20.54 kV in the test with a single plate, 30.511 kV with two plates, 56.328 kV with three plates, and at 196.85 kV for its 11 plates.

Index Terms

About four key words or phrases in alphabetical order, separated by commas.



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Hydrodynamic Model of Flood Flow Around Bridge in Ciujung River, Serang Regency, Banten

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Abstract:

Ciujung River is one of the most strategic river of Banten Province where it serves as natural drainage, water supply, irrigation, flood control and several national highway toward to the main Airport and Harbour should across it. In the same time, one of the highest risk problem could be generated is the breach of Ciujung Bridge on the highway of Tangerang-Merak. However, there is no previous study discuss about its potential hazard. This paper discuss the flood flow and the dependable flow pattern around Ciujung Bridge based on field observation, secondary data and mathematical model results. The flow pattern will be predicted by using Hecras 6.2 for 2d unsteady flow. The input hydrograph will be determined based on SNI 2415:2016 for a 50-year return period for the flood condition and Q90% for dependable flow condition. The model result is compared to the field data based on the previous observation of extreme flood in 2013. Model prediction of future extreme flood will be done using extreme rainfall of 100 years period. Based on this model result, a potential update of bridge pier that might be used to reduce the risk of the bridge or the river bank failure, could be discussed.



Process for Removal of Antibiotics in Water with Nanochar Derived From Corn Cob Waste

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Abstract

Pharmaceutical antibiotics have frequently been detected in aqueous systems. The presence of antibiotic residues in water poses serious risks to humans and ecology and is a major concern. Notably, biosorption has shown to be one of the promising methods for the removal of antibiotics from water. Our hypothesis is that corn waste biochar can sorb antibiotics like tetracycline (TC) on its surface and converting them into nanochar will furthermore increase the adsorption thereby aiding in the removal of antibiotics from water. Batch experiments showed that removal of TC by corn cob biochar (CCB 400 °C) and nanochar (NCCB 400 °C) prepared at a pyrolysis temperature of 400 °C was the highest compared to biochar and nanochar prepared at a pyrolysis temperature of 550 °C and 700 °C. Maximum sorption of TC over NCCB 400 °C surface (up to 99%) was observed within 36 h at neutral pH with an optimum adsorbent dose of 5 g/L, and the biosorption capacity of NCCB 400 °C was about 200 mg/g. Desorption studies showed a fair regeneration potential. Thus, corn cob nanochar produced at 400 °C could be a potential material for controlling water pollution due to veterinary antibiotics.



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Cough Detection System Using Machine Learning and Deep Learning Techniques

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Abstract

Coughing is the sudden expulsion of air from the lungs to clear the breathing passageways of unwanted irritants. However, if it sounds too loud and occurs for long periods, then it will cause a person chest pain, difficulty breathing and a high fever which requires treatment from a doctor. Knowing the seriousness of the matter, this research develops a cough detection system using machine learning and deep learning techniques. The system employed five distinct modules namely audio sampling, sound feature extraction, model training, cough detection, and audio data testing. Via the modules, when a person coughs then an important audio signal characteristic will be retrieved. It became an input for an Artificial Neural Network (ANN) model that has been trained with a cough sound dataset. The model will analyze the sound for a coughing fit and identify whether the sound is a cough or vice versa. A real-time test was arranged to test the performance of the model. It was programmed in an embedded controller and then installed to a device namely a Modular and Open System (MOST). The results demonstrate the model has a precision of 97.5% and successfully detects cough from a user.



A Framework for the Adoption of Blockchain Technology in Managing Medical Records in Africa

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Abstract:

The role of medical records in the delivery of quality healthcare cannot be overemphasized. Thus, healthcare organizations such as hospitals across the globe rely heavily on an accurate, well-organized and well-managed electronic medical records to deliver quality healthcare service. The records contain information related to patient's medical history and other information that facilitates healthcare decisions including easy access to patient's health information. Therefore, easy access to patient's medical history is an important aspect of healthcare service delivery that must be regulated and monitored because of the sensitivity of the information. Hence, various countries of the world adopted blockchain technology in managing medical records in their hospitals in order to enhance security and transparency in generating, storing and sharing medical data. However, hospitals in African countries have not given much attention to blockchain technology in managing medical records. This is because current approaches adopted is mostly paper-based, leaving many hospitals with challenges of missing files, or records, lack of information sharing between healthcare providers, insecure records and also inaccessibility of patients' health information for healthcare providers that are needed to make informed health decisions. Drawing from a case study conducted at teaching hospitals in Nigeria, this study used primary source of data which was collected using questionnaire and secondary data (literature) to propose a scalable framework that supports the adoption of blockchain technology in addressing the challenges associated with paper-based medical records in the health sector.

Keywords:

Medical records, medical records management, electronic medical records, blockchain-based technology, healthcare systems



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Design and Implement a Wireless Temperature Monitoring System using Noncontact IR Sensor Based on Arduino

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Abstract

COVID-19 and its genetic mutations pose a challenge to the world and affect the economic system of countries. Recently, countries were forced to reduce restrictions on airports, universities and schools. The main challenge is how to detect its symptoms without contact to the person who may have infection at local area. This depends on measuring the body temperature which represents the first and the most common symptom that can be identifies the infected people with virus or one of its strains. This paper presents an implementation of smart, and inexpensive human body temperature detector by using portable electric system based on Arduino UNO, and MLX 90614 IR temperature sensor. The measured temperature is sent to the control unit by wireless system through Bluetooth (HM-10 module) for the person walk near the IR sensor, and display it instantaneously on (16x 2) LCD. High temperature detection activates alert buzzer while a notification message sends to overseer within ten-meter distance to give a voice command asking the person to move to the safe area. The results are compared with conventional device and determined the average error between them, where the results proved the effectiveness of the proposed system in detecting the person who have high temperature without contact to that person. Where the system is operated effectively and satisfies the requirements for non-contact due to its high reliability, fast response time, and low consuming energy

Index Terms

Arduino uno, wireless sensor, temperature detector, monitoring system, corona virus.



Evaluation of Composite Slab Behavior with Different Span to Depth Ratio

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Abstract

Composite slabs comprised of profiled steel sheets and concrete topping are the most common floor solution in composite building construction. The main advantages of this structural system are expected to be faster construction, removal of standard replaceable shuttering, and a reduction in the number of props required. The profiled steel sheets serve during the construction stage as a formwork instead of the traditional formwork. Later, when the concrete is cured, the profiled steel sheets work as the main reinforcement in the composite slabs. Longitudinal shear bond resistance is an important factor when designing composite slabs. PSC and m-k design approaches are considered the most often utilized methods for determining the shear bond capacity of the composite slabs. Four specimens of composite slabs in simply supported conditions were cast and tested in this study using a four-point bending test. In addition, shear span and thickness effects were studied. In this study, the shear bond capacity of the composite slabs was calculated using the m-k method. The experimental test data used in the linear regression analysis were plotted to predict the m-k values. The structural performance of composite slab specimens was evaluated using failure modes, load-deflection behavior, load-end slip behavior, and horizontal shear bond strength. The results suggested that specimens with greater thickness and shorter shear spans can withstand greater loads than specimens with greater thickness and longer shear spans, which may indicate that slenderness is a critical factor impacting the ultimate capacity of composite slabs.

Index Terms

Composite slab, m-k Method, Failure Mode, Shear Bond, and End slip.



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Productivity of Hybrid Rice (Mestizo 27) Under Different Water and Nutrient Management System

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Faculty, Provincial Technical Institute of Agriculture, Isabela State University, Cabagan, Isabela

Abstract:

A field experiment was conducted to determine the productivity of hybrid rice production under different water and nutrient management strategies at Isabela State University, Cabagan, Isabela. The experiment was laid out in a split plot design with four replications with water management schemes as main plot treatment consisted of Alternate Wetting and Drying -15 cm (A1), Alternate Wetting and Drying -20 cm (A2), Field Capacity (A3) and Continuous Flooding (A4) and nutrient management strategies as subplot consisted of Recommended Rate (B1), Leaf Color Chart (B2), Critical Growth Periods (B3) and Rice Crop Manager (B4).

The Mestizo 27 subjected to different water and nutrient management system revealed comparable data on plant height, root length, unproductive tillers, panicle length and weight of 1000 grains. However, in terms of the number of productive tillers, number of filled grains, biomass weight, and grain yield per hectare, the application of nutrient management thru Leaf Color Chart (B2) gained highest. Similarly, the interaction effect of water management thru field capacity and nutrient management thru leaf color chart (A3xB2) resulted in numerous productive tillers which lead to highest yield per hectare, highest net income and return on investment. Moreover, the number of unfilled grains was significantly highest in nutrient management thru recommended rate (B1), critical growth period (B3) and rice crop manager (B4). Water management thru field capacity (A3), continuous flooding (A4) and AWD-15 (A1) in combination with leaf color chart (B2) produced highest grain yield among treatments. Hence, the use of leaf color chart in combination with different water management schemes was seen effective in maintaining and increasing the yield of Mestizo 27 even beyond safe AWD-15, hence, it is recommended

Keywords:

Productivity, Water Management, Nutrient Management, Alternate Wetting and Drying



Effect of Types of Organic Materials and Microbial Enrichment on C/N Ratio, Nutrition of Compost, and Microbe Population with *Trichoderma* sp. Indigenous Activators

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Abstract

The use of organic matter as fertilizer for crop production has received great attention for sustainable crop productivity. This is because chemical fertilizers are expensive and have a negative impact on the environment. Compost is an excellent source of micro and macro nutrients, the nutrient content depends on the composition and nature of the waste. This study aims (1) to determine the effect of *Trichoderma* sp. indigenous activator on the C/N ratio of compost and (2) to obtain the best mix of organic matter to be used as compost. The research method used a completely randomized design with four treatments and three replications. The treatments used are: 1). K3BO : (Cow dung, straw, husk, bran, *Trichoderma* sp., *Pseudomonas fluorescens*, *Bacillus thuringiensis*, *Azotobacter*). 2). K1BO: (Cow dung, straw, *Trichoderma* sp., *Pseudomonas fluorescens*, *Bacillus thuringiensis*, *Azotobacter*. 3). K2BO: (Cow dung, husk, bran, *Trichoderma* sp., *Pseudomonas fluorescens*, *Bacillus thuringiensis*, *Azotobacter*. 4). K0BO. Cow dung, *Trichoderma* sp, *Pseudomonas fluorescens*, *Bacillus thuringiensis*, *Azotobacter*. The results showed that the K3BO treatment consisting of cow dung, straw, husks, bran *Trichoderma* sp., *Pseudomonas fluorescens*, *Bacillus thuringiensis*, *Azotobacter* was the best compost mixture. Parameters observed on average temperature 37.34oC, pH 7.27, C/N 11.59, water content 13.57 with nutrient content of P 2.33%, K 1.24%. Enrichment with microbes gave a bacterial population of 530.67 x 10⁸.

Index Terms

Compost, *Trichoderma* sp, *Pseudomonas fluorescens*, *Bacillus thuringiensis*, *Azotobacter*



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Machine Learning-Based Car Specification Mismatching System for Pre-Crime Detection

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Abstract:

Even with the installation of security systems and video cameras in residential buildings, the number of complexes and crimes in the neighborhood continues to worry residents in the modern era. For instance, the latest statistics show that the rate of vehicle theft is the highest among the crime rates in Malaysia from the year of 2010 to 2017. It is common for criminals to take advantage of security flaws, such as when a phony license plate is put on a car and the security system misses it, allowing the criminals to enter the facility with ease. Hence, this paper intends to close the loopholes that criminals exploit by developing a system to identify car specifications such as the vehicle type, license plate, logo, and color using machine learning. This data will then be used to match the information of the car's owner, allowing the security system to discover and prevent any crime before it happens. Machine learning and deep learning models such as MobileNet SSD, YOLOv4, OCR and TensorFlow Lite color models are used to predict the car specifications. When mounting security cameras perpendicularly on the front-sides of vehicles to capture high-resolution photos, the proposed system is able to achieve a considerable performance accuracy of 100% for vehicle type, 97% for license plate, 74% for logo, and 68.5% for color predictions respectively.

Index Terms:

Car specification detection, machine learning, security system, vehicle crime.



Design of Low-Cost Active Noise Cancellation System for Automobile

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Abstract:

The noise in the automobile affects the driving experience. The noise in the car is dominated by low-frequency noise which can be effectively reduced by active noise cancellation (ANC). The commercial ANC system employed in the car is often adopting digital signal processing (DSP) to achieve noise cancellation, in which the cost is relatively high, and it is pre-built in the automobile itself. In this work, a low-cost portable analog ANC system is designed to cancel the noise in the automobile. Extensive experimental tests are carried out to suppress the single-tone noise in the automobile, ranging from 100Hz to 500Hz in a frequency step of 100Hz. The proposed ANC system managed to reduce a maximum of 16.7dB of noise at 200Hz and a minimum of 1.7dB of noise at 400Hz. The results show that the analog ANC system designed can significantly reduce the low-frequency noise in the automobile.

Index Terms:

Active Noise Cancellation (ANC), automobile, low-cost, low-frequency noise.



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Critical Review on Machine Learning in 5G Mobile Networks

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Abstract

Fifth Generation Wireless Technology (5G) was created by many different organisations through the 3rd Generation Partnership Project (3GPP), and it is a continuation of the previous wireless technology generations that allows for various general improvements over its predecessors, like better latency and faster download speeds. These improvements offered by the Fifth Generation networks allow for a variety of new applications that increased the complexity of maintaining QoS across the network due to their heterogeneous QoS requirements. Many approaches were proposed in the literature to tackle this issue, such as implementing network schedulers that can leverage Machine Learning (ML). ML is a branch of artificial intelligence that focuses on the use of sophisticated algorithms to imitate the way humans learn. ML can be split into different categories, i.e., supervised, unsupervised, and reinforcement learning algorithms. Supervised learning, in which the algorithm is taught by example, in which the operator provides a known dataset and its answers to train the algorithm. unsupervised learning, in which the algorithm studies an unlabeled training dataset. Lastly, there is reinforcement learning, in which the algorithm is provided with a set of rules, and parameters, also referred to as a reward function. The algorithm is then left to explore the best course of action to achieve the best possible results. This has motivated us to study the existing research regarding ML in network orchestration.

Index Terms

5G, Network Slicing, Reinforcement learning, QoS.



Performance Analysis of Chronic Kidney Disease Detection Based on K-Nearest Neighbors Data Mining

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Abstract:

Kidney diseases are a leading cause of death in the United States. According to the Centers for Disease Control and Prevention (CDC), in 2021, approximately 37 million US adults, or 1 in 7, are estimated to have chronic kidney disease (CKD), and most are undiagnosed. Moreover, Medicare costs for people with CKD were \$87.2 billion in 2019. Thus, data mining has been used in the healthcare industry to assist authorities in providing patients with health information as well as identifying patients earlier. In this paper, data mining is implemented for the classification of laboratory data from CKD patients. The K-Nearest Neighbors (KNN) algorithm is proposed to train the machine learning model to detect CKD based on blood test lab results such as sugar count, white blood cell count, red blood cell count, hemoglobin, albumin, etc. The model also includes general factors such as age and blood pressure. From the obtained results, other machine learning methods produce inferior accuracy, such as linear regression and decision tree. By training the model on a dataset containing 400 different anonymous patients using KNN, the accuracy reaches 99%. Based on the prediction, around 40% of the patients are fully healthy. This paper aims to detect whether the patient has CKD or not, depending on lab results and general information about the patient.

Index Terms:

Chronic kidney disease, data mining, K-Nearest Neighbors, linear regression, decision tree



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An Intelligent Waste Management System Enabled by IoT

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Abstract:

Waste management is an important aspect to be addressed in Smart Cities and buildings. An effective waste management system can reduce the reliance on workforce and also reduce the labor cost required for systematic waste collection. The advancement in IoT technology enables waste management to be carried out effectively and promptly when the garbage is fully occupied. This work aims to develop a smart waste management system based on the Internet of Things (IoT), implemented with sensors that can track the level of waste in the garbage bin. The developed idea here is novel, deploying a simple IoT enabled ultrasonic sensor setup to realize waste level monitoring and remotely making the data available to users so that waste collection can be carried out effectively and timely upon full occupancy.

Index Terms:

Waste Management System, IoT, Ultrasonic Sensor.



Internet of Things Agriculture Precision Monitoring System based on Low Power Wide Area Network

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Abstract:

Nowadays, agriculture is the main source of livelihood of many people in different parts of the world. It is the most important occupation of many families in most world countries. Unfortunately, farmers are still reliant on traditional techniques that have evolved hundreds of years ago especially in oil palm plantation. One of the major key factor in getting high and sustainable oil palm yield on peat is through the implementation of good precision water management. This basically involves maintaining the water table at the required optimum depth. Prolong and extreme low water table on peat has resulted in drastic decline in oil palm yield. In this work, Internet of thing (IoT) with long range wide area network (LoRaWAN) algorithm is designed for precision monitoring purpose in agriculture. In methodology, a LoRaWAN, with a long-range, low-power, low-bitrate, wireless telecommunications system is designed as an infrastructure solution for the Internet of Things. The end-devices use LoRaWAN across a single wireless hop to communicate to gateways which connected to the Internet and which act as transparent bridges and relay messages between these end-devices and a central network server. At the end, the outcome is to develop a cost effective precision water management support algorithm by using LoRaWAN and IoT.

Keywords:

IoT, LoRAWAN, Wireless Communication



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Evaluation of Attack Environment Effect of Security in Data Centers of Internet of Things

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Abstract:

Nowadays, the implementation of Internet of Things (IoT) is getting higher in demand and in every sectors now involving Internet of Things. Not only in automation, health and agriculture also widely involves in Internet of Things. Due to this motivation, the better performance of the system is demanded. In this work, new IoT networks is designed to be strengthened by incorporating with 5G system for more scalable and efficient. The proposed 5G and IoT networks able to improve the user experience in terms of latency, transmission speed and device connection. The obstacles of integrating Internet of Things systems are discussed in this work, and the technology's potential is demonstrated through the implementation of a resource management application. The proposed 5G and IoT networks able to eliminate this problem while also strengthening the IoT system in terms of interference control, SINR, and system throughput. Furthermore, the proposed algorithm shows better performance in IoT networks and able to reduce the interference in IoT system for various distances of nodes. Finally, the SINR of the system provide better result in dynamic spectrum for both in band and out band spectrum.

Keywords:

Internet of Things, 5G, Wireless Communicatio



Algorithm of Attack on the Data Center in an IoT Network

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Abstract:

Everyday humans are essential in data management, processing, and dissemination in their life. The internet of things (IoT) is a data network and Cyber attacks target the data centre. As IoT data usage expands, providers confront new security, capacity, and analytics challenges. The problem statements found are the difficulties providers confront and users are shut off from a server by needless requests, which overload data centres and slow down or completely fail the system. This work is introduce a novel method to reduce the effect of the attack on security and analyze a data centre attack. As a result, there is no silver bullet for the IoT dilemma. The attacker can target IoT-enabled devices, increasing the chance of important data packets being lost and the network's overall lifespan. As the number of users increases, so does the volume of data exchanged. The attack on the data centre will increase unwanted sessions, energy consumption and hence productivity. The proposed methods able to cover attack mitigation to reduce network security risk and assure network longevity. The energy analysis of a data centre electrical infrastructure is incomplete without considering traffic volume. To evaluate a network's true performance, consider the target area's user density, traffic demands, and signal to noise plus interference (SINR). This work focus with 500m radius where users uniformly dispersed and a noise power density of -174 dBm/Hz noise. As a result, the proposed dynamic spectrum output spectrum is on SET or approaching magnitude 1 on CDF curve at -16 decibels.

Keywords:

Wireless Networks, Internet of Things, 5G Communication



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Development of An IoT-Enabled Photovoltaic-Battery Renewable Energy System

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Abstract:

Solar energy is considered as a prominent source of renewable energy, mainly due to the vast abundance of sunlight and rapid advancements of photovoltaic (PV) technology. The performance, reliability and lifespan of PV systems are severely affected by numerous environmental factors and fault occurrences, which include:

(1) Extreme swing in the operating temperature;
(2) Low solar irradiation levels which appear undetected in PV systems, resulting in energy losses and degradation of PV panels; and

(3) Non-homogenous shading and accumulation of dirt on PV panels, causing thermal imbalance and hotspots on the panels. Therefore, it is important to monitor the operating temperature and homogeneous detection of sunlight on the PV modules to guarantee efficient energy production. In this paper, we present the development and demonstration of a sensor-assisted Internet of Things (IoT)-based photovoltaic-battery renewable energy system. The adoption of the IoT solution for monitoring the real-time variations in environmental factors and system performance is discussed here. For the PV-battery hardware module, solar panels along with rechargeable batteries are constructed to supply the system. Inverters and controllers are used to synchronize the voltage level and transformation of AC power from DC power. In the design of the IoT system, the Arduino Mega microcontroller and ESP32 TTGO board are used along with sensors for recording the temperature, presence of dust/dirt, and voltage and current levels. The working prototype enables real-time data to be captured and sent to the cloud database for data collection, performance analysis, and diagnosis/detection of faults in the proposed system.



Dual Mode Solar Power for IoT based Smart Farming System

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Abstract:

Rapid urbanization and emerging Internet of Things (IoT) technology have put smart farming into a fast development trend. The IoT technology improves the modern information and communication technologies which has improved the effectiveness of smart farming. It optimizes and increases the productivity and quality of plants with minimum human labour required. This project introduced an IoT smart farming system powered by a dual-mode solar system. Agriculture sensors are used to collect data from the plants. It collects soil data which includes soil moisture, temperature and soil pH level and pushes data to IoT internet cloud to be analyzed and displayed on IoT platforms such as ThingSpeak and IoT Blynk mobile application. This project is integrated with an irrigation system that can water the plants automatically and manually, and the system is powered by dual mode solar energy. The dual mode power allows switching from solar energy to wired power whenever there is insufficient of solar power. This project aims to help farmers to implement an affordable smart farming system using renewable energy. The system allows them to monitor crops data in real-time, to track and to make further analysis on the data obtained from the crops which allows the utilisation of water resources effectively. A complete robust model of the IoT smart farming system is developed in this project.

Index Terms:

Solar power, Smart Farming System, IoT.



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Modelling Learner's Perception of Blended Learning in a Developing Country

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Abstract:

The purpose of this research was to understand the factors (collaboration, instructor involvement, nature of the course, self-learning, and internet experience) that influence learners' perceptions of blended learning. A total of 200 completed questionnaires were considered usable for this study. Structural equation modelling (SEM) using AMOS 23 was used to test the developed model. The findings show that all five hypotheses were supported. Three of the five predictors tested in this study had a positive effect on blended learning perception. The most influential predictor of learner perception was collaboration, followed by instructor involvement and self-learning, indicating that the facilitation of collaboration, self-learning, and more instructor involvement in the course drives users to use blended learning. In conclusion, this study is extremely beneficial to the education sector, particularly those involved in learning and delivering blended courses. The findings of this study will undoubtedly aid the Ministry of Education and Higher Learning Institutions (HLIs) in gaining a better understanding of the key factors that contribute to blended learning perception in order to gain a competitive advantage in the learning hub.

Keywords:

blended learning, theory of transactional distance, perception, collaboration, instructor involvement, nature of course, self-learning, internet experience



Nami (*Dioscorea Hispida*) and Wild Ubi (*Dioscorea Villosa*) Fermented as Value-Adding Nutrient Feed Resources Using Three Fungal Species

ROMEO I.RAMOS

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Abstract:

The study was conducted to determine the nutrient content of fermented nami and wild ubi. In the enrichment of nami and wild ubi, species of mushroom fungi *Pleurotus ostreatus*, *Volvariella volvacea*, and *Ganoderma lucidum* were used. Acceptability and palatability trials, a total of 36 heads, six weeks of age non-descriptive layer-type chickens were used. During data gathering, the two organic substances fermented with three species of fungi were purely fed to the experimental birds. Results of laboratory analysis revealed that there was an increased of crude protein content of nami and wild ubi after fermentation from 9.48 to 16.44 and 4.73 to 16.10 respectively. *P. ostreatus* was found the most effective fungal species to ferment the two feed resources. *P. ostreatus*-fermented wild ubi contained 16.62% while nami disclosed an 18.80% compared to the 16.52%, 16.02%, 16.19% and 13.31% crude protein content of wild ubi and nami after fermentation by *V. volvacea* and *G. lucidum* respectively. Results of the study revealed that the two fermented products gave comparable level of acceptability as nutrient enriched feed resources. The used of fermented pure cultures white rot fungi (*P. ostreatus*) consistently performed good level of acceptance as to compare with the two other inoculant. Experimental birds adjudged promising level utilization on the acceptability of fermented products. *P. ostreatus*, *V. volvacea* and *G. lucidum* equally hurdle set of parameters to the high level of medium range in the preference ranking of palatability index in terms of Statistical Tool for Agricultural Research evaluation

Key Words:

nami, wild ubi, fungi, fermentation



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Effect of Reinforcement Layer Number on Energy Absorption of Jute GFRP Hybrid Hollow Tubes Under Axial Loading

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Abstract

The purpose of this study is to design and fabricate three various numbers of GFRP layers in a jute-GFRP hybrid tube based basic cylindrical composite tube, as well as to investigate the mechanical characteristics of each tube. Jute, E-type fiber glass, and epoxy resin in a 1:1 epoxy hardener ratio are used to create the composite material. The method of fabricating the composite material is compression molding. Each tube is made up of one, two, or three layers, which are then mechanically and characteristically tested. After the three different layer tube bases were done fabricating, the cut specimens of each tube were subjected to compression tests. The findings of the mechanical tests were used to assess the mechanical behavior of the three layers of GFRP in jute-GFRP. The three-layer GFRP has the greatest average maximum force value of 1248.47721 N, as determined by compression testing. The average maximum force values for the one-layer and two-layer GFRPs were 1149.78383 N and 3896.62613 N, respectively. This demonstrates that three layers of GFRP in jute-GFRP can sustain a large amount of vertically applied compressive force, thus have the tendency to resist structural deformation.



Good Practices of ultrasound biometric authentication for connection with globalization

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Abstract

The ability to capture 3D images and detect liveliness through biometric identification systems based on ultrasound images has taken the technology a step further today. Technology is changing to keep pace with the changing world. So the main technology used to photograph human hands is ultrasound. Here human biometric features depend on the person's appearance. Bangladesh is moving forward with the world in the dynamic course of digital revolution. So it will contribute to technology as a bright prospect for Bangladesh. The main objective of the research is to take the technology of Bangladesh to the world. Information's were collected by questionnaire survey and were collected by face to face, then analyzed it. The research is based on both qualitative and quantitative data. From the existing picture obtained and analyzed from gape practices. So steps are taken by the concerned authentication will be helpful. Finally some guidelines are recommended.

Keywords

ultrasound biometrics, authentication, globalization



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Designing Malaysian Based Dangerous Traffic Situations in Driving Education based Prototype Simulator

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Abstract

Dangerous traffic situations always find its place in our daily life even when we are just passengers in a transport. Especially in the urban areas such as Klang Valley, a brief internet search would result in many recent serious accidents. With driving education in mind, we have developed a prototype simulator for driving education that has been pilot tested with a small sample size. In the previous prototype, we only included track-based training based on Malaysian standardised driving exams. We realise that it is not enough to prepare learner drivers for the real world driving as there is no risk posed in track-based training. Hence, we designed 3 different scenarios that are commonplace on Malaysian roads. We skimmed through dashcam footage of Malaysian drivers from the internet and personal vehicles and narrowed down a few of the most common dangerous traffic situations. Then we developed 3 of those scenarios with a rudimentary AI that can help replicate the traffic scenarios that we wanted. Resulting in these developed scenarios to be quite realistic when we ran it in our prototype.



Utilization of Local Filter Material with Combination of Ion Exchanger Media for Brackish Water Treatment

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Environmental and Hydraulic Engineering Laboratory

Abstract

Indonesia, the world's biggest archipelagic state with a huge coastline territory, continues to struggle with a lack of clean water due to contamination by seawater. In this research project area: Sidoarjo Regency, an Indonesian rural and coastal region, primarily uses brackish well water with a higher salinity than fresh water for their daily needs. While brackish water is plentiful in coastal regions, it has certain negative effects, such as causing crop failure, harming livestock, and producing rust on equipment. The purpose of this research is to provide clean water that is generated when local filter materials are combined with ion exchanger media, allowing the treated water to fulfill clean water standards. For the methods used in this study, brackish water is physically treated by passing it through adsorbents in local materials and continued through ion exchanger media. The outcomes proved that filtered water greatly improved by decreasing TDS and EC by around 68%. Treated water is also physically clear, colorless, odorless, and tasteless. It could be concluded that brackish water can be treated by combining local filter materials with ion exchanger media, thus ensuring the availability of clean water in coastal areas.

Index Terms

brackish water, treatment, local materials, ion exchanger media



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Electrode's modification using multi-wall carbon nanotubes for the integrated system of microbial electrolysis cell and anaerobic digester

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Abstract:

Microbial electrolysis cell has been one of the most interesting and effective approaches in CO₂ and H₂ upgrade within the anaerobic digestion system to bio-methane (MEC-AD). While the operational factors play a great role in the system's performance, electrode's choice is of the same importance in supporting the biofilm formation of fermentative and electroactive microbes. It is also of great importance in determining the microbial community on cathode. The shift into using carbon-based electrodes as anodes has been increasing in the past few years, while cheap anti-corrosive, biocompatible metal has been used as cathode. Multi-wall carbon nanotubes have been proven to increase electrode's biocompatibility and conductivity. In addition, recent studies have reported the enrichment of methanogenesis with CNT. This research work focuses on the modification of stainless-steel mesh cathode and carbon felt anode using multi-wall carbon nanotubes to enhance the performance of the MEC-AD system using MWCNT solution. The MWCNT adhesion and the microbial growth on the electrodes and behavior are explained using scanning electron microscope (SEM) images. In addition, the effect of modification on biomethane production was monitored.



Hydrodynamic Model as Risk Assessment Tool for Tidal Flood Countermeasures in Pasuruan Regency, Indonesia

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Environmental and Hydraulic Engineering Laboratory

Abstract

Tidal flood is becoming a more common problem for coastal areas around the world. A supermoon event will bring additionally tidal flood impact with unusual tide height. As main negative side effect, clean water crisis happened. Pasuruan regency in East Java, Indonesia as one of the impacted coastal areas has been chosen as a research location. The tidal flood has caused a degradation in the standard of environmental sanitation and contaminated clean water supplies network. The objective in this research is to provide a robust hydrodynamic model with Root Mean Square Error (RMSE) value analysis as validating method for initial risk assessment and raising the community awareness and readiness to face the tidal flood impact. The methodology used in this research is utilizing tide prediction software and hydrodynamic models in the coastal region of the research area. This hydrodynamic model can serve as the foundation for knowledge and applications in tidal flood countermeasures in coastal areas. As the initial implementation, tide prediction software has been installed on the mobile phone to use as a base for information about incoming tides. The outcome of this research demonstrates that the RMSE value of the hydrodynamic model fulfills the accuracy within the range of roughly 0.07 m after calibration and verification have been completed.

Index Terms

Hydrodynamic model, tidal flood, water crisis.



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The Stirring Process in Bed Dryer Resulting in the Increase of Airflow used to Assist Drying

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Abstract

Uneven drying results are a major problem in the performance of the Flatbed Dryer. In order to produce uniform drying amongst the bottom, middle and top layers, it is imperative to stir/move around the commodity material being dried. In addition, the changes in the local porosity of the material's composition cause an increase in air velocity. In consequence, an even drying result requires the materials to be continuously moved around. This research investigates the role of continuous stirring in creating inhomogeneous permeability of the materials in the drying process. The experiments are carried out with a Bed Dryer machine equipped with automatic stirring.

Keywords

FlatBed Dryer; Autostirring; Permeabilitas; Porosity; Airflow velocity



Development of Risk-Based Dam Safety Framework in Climate Change Condition for Batu Dam, Malaysia.

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Abstract

Dam safety management is the crucial infrastructure as the dam failure has catastrophic effect on the community. The dam safety management is the effective framework of key actions and activities to the dam owner to manage the safety of the dam for its entire life cycle. However, maintaining dam safety is a challenging task as there are changes in current dam states. These changes introduce new risks to the dam safety which have not been considered when the dam was designed. A new framework has to be developed to adapt the changes of the dam risk and make the dams resilient. This study proposes a risk-based decision-making adaptation framework for dam safety management. The research focuses on climate change impact on hydrological situations as it causes the floods and damages the dam structure. The risk analysis framework is adopted to improve the dam management strategies. The proposed study encompasses four phases. To start with, measuring the effect by assessing the impact of climate change on embankment dam, the second phase is to analyze the potential embankment dam failures. The third is analyzing the different components of risks related to dam, and finally develop a robust decision-making framework.

Keywords

Climate Change, Embankment dam, Failure, Risk-Informed Decision Making.



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Application of Remote Sensing and GIS Technology for Monitoring Coastline Change in Han River, Da Nang City, Vietnam Using Remotely Sensed Data

Nguyen Trong Khanh

Department of Geomatics Engineering, Faculty of Civil Engineering, Vietnam National University Ho Chi Minh City University of Technology (VNU-HCMUT)

Abstract

The main objective of this study focuses on using the sentinel - 2A remote sensing satellite imagery in monitoring coastline changes of the Han River in the period from 2016 to 2020 at Da Nang city, Vietnam. All satellite imagery data are collected at the same time and weather conditions to reduce errors in image interpretation. The raster shoreline data were extracted from the sentinel 2A image using the automated water extraction index (AWEI). These raster data will then be vectorized using the QGIS software, the root mean square (RMS) error between the interpreted shoreline positions and the GPS field trip shoreline positions is calculated with acceptable accuracy. Finally, the overlay of shoreline data over the years is performed to obtain shoreline change data for analysis and assessment. Based on the results of the research, the shoreline changes in the Han Riverbank in Da Nang city are very complex and concentrated in two main parts, which are the east bank in the north of the river and the west bank in the west of West Green Island.

Index Terms

Coastline change, GIS, Remote Sensing, Sentinel-2A



Detecting Shoreline Change in the Coast of Quang Nam Province, Vietnam Using Modification of Normalized Difference Water Index (MNDWI)

Nguyen Trong Khanh

Department of Geomatics Engineering, Faculty of Civil Engineering, Vietnam National University Ho Chi Minh City University of Technology (VNU-HCMUT)

Abstract

This research focuses on gathering remote sensing imagery data, exploring coastline detection methodology, and detecting shoreline changes in the coast of Quang Nam province from 2016 to 2020. Sentinel -2A satellite images from 2016 to 2020 were collected. These datasets are pre-processed including radiometric and geometric calibration, then they are processing to generate the MNDWI imagery. The shoreline data will be extracted using GIS technique with a suitable threshold. To validate the precision of the interpreted shoreline, the collection of shoreline GPS data were used to obtain the Root Mean Square (RMS). The overlay of shoreline data from 2016 to 2020 was done to gain the shoreline changes. It should be noted that in the study area, the process of erosion is continuously taking place with higher risks and greater extent. The area where erosion occurs is concentrated mainly on the beaches of Hoi An City and Cua Dai area.

Index Terms

MNDWI, Remote Sensing, Sentinel-2A, Shoreline change



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The Extraction of Built-Up Land Areas from Sentinel Satellite Imagery in Ho Chi Minh City, Vietnam

Nguyen Trong Khanh

Department of Geomatics Engineering, Faculty of Civil Engineering, Vietnam National University Ho Chi Minh city University of Technology (VNU-HCMUT)

Abstract

This research mentioned spectral index techniques to extract built-up land features from sentinel 2A and 2B imagery taking Ho Chi Minh city, a biggest urban in Vietnam as examples. The study selected seven indices, Normalized Difference Built-up Index (NDBI), New Built-up Index (NBI), index-based built-up index (IBI), INDBI ((Improve Normalized Difference Built-up Index), NBAI (Normalized Built-up Area Index), BRBA (Band Ratio for Built-up Area) and BAEI (Built-up Area Extraction Index) to extract built up areas. Initial imageries were pre-processed, and bands were combined to gain seven spectral index images. Then, a suitable threshold was applied into each index image to extract built up regions. To validate the precision of extracted built up, the GPS field trip data were collected and overlaid onto interpreted built up lands to generate Overall Accuracy and Kappa index. From the results of assessing the accuracy of each index image, the NBAI index has the highest overall accuracy and the highest Kappa coefficient of 87.4% and 0.742, respectively. The lowest accuracy was the BRBA index with 59.6% overall accuracy and 0.183 with the Kappa coefficient.

Index Terms

Build up land, GIS, Remote Sensing, Sentinel-2A

