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WCASET-2021

33rd World Conference on Applied Science, Engineering & Technology

26th – 27th February 2021

Manila, Philippines

ORGANIZED BY

INSTITUTE FOR ENGINEERING RESEARCH AND PUBLICATION (IFERP)

33rd World Conference on Applied Science, Engineering and Technology

(WCASET – 2021)

Manila, Philippines

26th- 27th February 2021

Institute For Engineering Research and Publication

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Editorial:

We cordially invite you to attend the ***33rd World Conference on Applied Science, Engineering and Technology (33rd WCASET)*** which will be held **Manila, Philippines** on ***26th-27th February 2021*** - Virtual conference. The main objective of ***33rd WCASET-2021*** is to provide a platform for Researchers, Engineers, 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 there view process, and to the authors for contributing their research result to the conference.

Since December 2020, the Organizing Committees have received more than 120 manuscript papers, and the papers cover all the aspects in Electronics, Computer Science, Information Technology, Science Engineering and Technology. Finally, after review, about 30 papers were included to the proceedings of ***33rd WCASET***.

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of ***33rd WCASET***. We would like to thank the keynote and individual speakers and all participating authors for their hard work and time. We also sincerely appreciate the work by the technical program committee and all reviewers, whose contributions made this conference possible. We would like to extend our thanks to all the referees for their constructive comments on all papers; especially, we would like to thank to organizing committee for their hard work.

Acknowledgement

IFERP is hosting the ***33rd World Conference on Applied Science, Engineering and Technology*** this year in month of February. The main objective of 33rd WCASET- 2021 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.

Mr. Siddth Kumar Chhajer
Managing Director
Institute for Engineering Research and Publication (IFERP)

Message from Keynote Speaker

Dr. Diosdado Cuison Caronongan

Dean, Computer Studies

University of Luzon,

Dagupan, Philippines

I am deeply honored to be given this privilege of welcoming all the esteemed researchers, educators, participants and guests to the 33rd World Conference on Applied Science, Engineering and Technology.

Let me thank and congratulate the prime movers of the Institute for Engineering Research and Publication (IFERP) for continuously providing the much-needed venue for knowledge sharing among and collaboration with the experts in the different fields of applied science, engineering and technology, even in this trying time.

To all of us present in this year's conference, I say "Mabuhay" and happy learning to us all!

Dr. Diosdado Cuison Caronongan

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CONTENTS

CONTENTS

CONTENTS

CONTENTS

33rd WCASET - 2021

33rd World Conference on Applied Science, Engineering and Technology

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ABSTRACTS

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Attitudes Development of Occupational Therapy Interns from a Private School in Three Clinical Settings: A Descriptive Study

Asst. Prof. Kim Gerald G. Medallon, **MHPEd, OTRP**, Internship Supervisor, Department of Occupational Therapy University of Santo Tomas, Espana, Manila, Philippines

Abstract:--

Purpose: The purpose of this study is to describe the status of attitudes development of occupational therapy interns from a private school in three clinical settings. It aims to identify the attitudes that are being demonstrated, determine their consistency and extent of manifestation, identify the factors facilitating and/or impeding their consistent and full extent manifestation, determine the current knowledge, attitude, and skills of OT clinical teachers in attitudes development, and to identify the utilized teaching-learning strategies. Methods: This study utilized a qualitative cross-sectional design involving observation, in-depth interviews, and reviewing of documents to attain the research objectives. OT clinical teachers and interns from a private school rotating in the National Capital Region were invited and participated in this study. Descriptive and content thematic analyses were used for data analysis. Results: The attitudes that were commonly manifested in the three settings were initiative, adaptation, patience, and collaborative practice. Negative attitudes such as irresponsibility and special preference were also observed. Most of the attitudes that were observed and/or reported were lacking consistency in terms of its manifestation. The extent of manifestation of the identified attitudes may be described as being narrower in scope as compared to the expected affective outcomes in the training manuals, standards of practice, and code of ethics. The attitudes that are currently manifested are generally caused by factors outside the direct training received in the classroom and affiliations. Factors affecting the full extent manifestation of these attitudes include limited knowledge and weak skills of the clinical teacher and personal factors of the intern, vague specification of affective outcomes, insufficient content areas, limited teaching-learning strategy, weak instruction, limited pre- internship preparation, limited expectations on the part of the clinical teacher, and limited features of the center. Implications: Results of this study may pave way to possible policy and curriculum changes to ensure that attitudes would not just be listed as learning outcomes but would really be emphasized in the teaching-learning process. Improving the quality of the learning outcomes and instruction, through remediating the identified contextual factors, would be helpful in producing future occupational therapists who are supporting health and participation in life through engagement in occupations.

Keywords:

attitudes, internship, occupational therapy, perspective

The "Self-Learning Query" Algorithm for Searching Scientific Publications across Specialized Search Engines

Nikolay V. Kovalev, Vice President, Developer Soft and Technical Support Sea Inc., Angeles City, Philippines
Dr. Rosanna A. Esquivel, Assistant Dean, College of Computer Studies, Angeles University Foundation, Angeles City, Philippines

Abstract:--
Typically, a search operation on Big Data is complicated task due to different formats and different nature of the data. To simplify it the user may implement special algorithms to process different data for uncertain criteria. The "self-learning query" algorithm presented in this work allows to search in Big Data either for certain or uncertain search criteria's with minimum attention from the data programmer. It uses accumulated search statistics as the basis to make the result set more precisely according to the search criteria, so as long the user work with the system as more precise will be the results. The algorithm presented in this work allows data scientists to search for uncertain data and potentially discover results faster by offloading the burdens of data management and provenance to the expert system.

Index Terms
Big Data, Search algorithm, Knowledge base, Data Mining, Logic programming, Machine learning.

Crop Leaf Disease Detection and Classification using machine learning approaches

Deepak Mane, Senior Data Scientist , Analytics and Insights , Tata Research Development & Design Center

Abstract:--

Crop leaf diseases are a significant yield and quality constraint for growers of crops in world. Crops diseases can be bacteria , virus , fungal, bacterial, nematodes. It damages different parts of crop's plant There is big challenge in identifying symptoms and don't have plan when and how to effectively control diseases is ongoing issue for farmers Crop disease diagnosis is a very important task for every farmers and individuals in order to prevent various types of losses like poor quality and quantity of crops , less productivity, Machine learning and image processing will help in identification and diagnose the disease of the crop. which help the farmers to identify and diagnose it very fast as compared to traditional approach of checking every crop leaf predicting the disease with his knowledge and experience it will helps also in contribute to disease management packages and forecasting tools, and identify new incursions of crop pathogens or strains into WA.

Learning Orientation, Service Innovation and Performance: A Case of Hotels in Ilocos Sur

Princess Neptalia R. Quebral, University of Northern Philippines

Abstract:--

The study determined the level of learning orientation and service innovation; likewise, it assessed the performance of hotels in Ilocos Sur. It employed the descriptive-correlational method of research. It found out that the hotels have high levels of learning orientation and service innovation practices in service, market, process, and organization-related dimensions. The hotels in Ilocos Sur have a high level of performance. Managers are still encouraged to pair employees with mentors. Mentoring relationships can foster positive and productive working relationships, helping employees learn and gain encouragement and support in their jobs. When coached with encouragement, employees can help the hotel adapt to changes and reach the next level of success. Hotels should build more networks. By having more connections, there will be more significant opportunities. Having more social networks and local and international professional groups like Hotel and Restaurant Associations of the Philippines and Philippine Hotel Owners Association Inc. will help hotels build stronger connections, thus increasing their financial, guests, and internal business process performance.

Discovering Design Patterns and Common Functionality on Smartphones Specifications using Different Data Mining Techniques

Denver Jhon R. Calantoc, DIT Student, De La Salle University – Dasmariñas
Mary Ann Taduyo, DIT Student, De La Salle University – Dasmariñas

Abstract:--

Nowadays people find smartphones as necessity rather than a commodity. Smartphones are highly developed mobile phones with multiple features that could be useful for personal and business. Several models were released on the market because of its high demand. Hence, consumers had difficulties on purchasing the right smartphones. Several studies had been done on the purchase intentions of consumers and data mining on a smartphone to seek patterns in human activity. Clustering aims to group or cluster data such that objects belong on same cluster are more similar to each other than to objects from other clusters. This research will analyze smartphone specifications using data mining techniques to discover design patterns and common functionality. This paper aims to find useful patterns that will be used in identifying phones using K-Means clustering and Gaussian Mixture Model. A cluster of camera smartphones with a higher camera, memory, and battery specifications and bigger display size. There are clusters of gaming and entertainment smartphones that have high resolution, bigger screen, and higher memory storage and have higher battery storage. Two models were developed and were able to predict the display size and battery capacity of smartphones using the multiple regression algorithm.

Intersection Design Analysis and Control of National Roads Based on the Measure of Performance and Benefit Cost Ratio: Daang-Maharlika and DM-Junction Malasin located at Bambang, Nueva Vizcaya

Alyssa Mae J. Padura, BSCE, Mapua University
Jocelyn S. Buluran, Professor, Mapua University

Abstract:--

The critical intersection of Daang Maharlika which forms the backbone of our Asian Highway in the Philippines and one tertiary national road, DM Junction-Malasin is considered a blackspot area in Bambang, Nueva Vizcaya having an average of 8.5 crashes per year. The crash pattern shows that most crashes are head-on and rear end crashes with a high participation rate of motorcycles at 52.17%. Its mobility is at the worst operating condition at LOS F, having an overall intersection delay of 1089.09 seconds. The mobility and safety of an intersection are two of a few but the most important factors in the design phase of an intersection. Further improvement on the geometry and intersection traffic control are considered in order to create design schemes that address the problems present in the intersection from the observation report as well improving the mobility by reducing the intersection delay. The process of calculating the delay and Level of Service are identified from the result of the scheme simulation in the traffic flow simulation software, PTV Vistro and Vissim. In designing the intersection, two criteria are considered, the measure of performance which is the reduction of the existing delay and the benefit cost ratio, which addresses the feasibility of each scheme. The intersection is warranted to be designed as an unsignalized and signalized intersection. The signalized intersection design, Scheme 4 reduced the overall intersection delay to 47.30 seconds but very with a low BCR of only 1.60. After considering both the reduction of intersection delay and BCR, Scheme 2 is recommended, having all-way stop control with modified turning radius, no movement restrictions with an intersection delay reduced to 170.34 seconds and a high BCR of 5.61.

Keywords:--

Crash Patterns, Intersection Control, Traffic Flow Simulation Software, Measure of Performance

Design of a Full Adder-Subtractor using Polymorphic Gates

Joshua Hernandez, De La Salle University - Dasmariñas
Giovanni Ariola, ECE Faculty, De La Salle University – Dasmariñas

Abstract:--

When making circuit design decisions, it is important to take into consideration the performance of the circuit. Power and speed are some of the primary parameters that must be considered. Full Adder-Subtractors (FAS), a backbone of any digital computer system, require low power consumption and high performance for efficient computing. An improvement in the performance of the adder-subtractor is an improvement in the performance of the whole digital computer system. This paper proposes an alternative design of a FAS using polymorphic logic gates that uses the free evolution approach. In the free evolution approach, the NMOS and PMOS transistors are interconnected arbitrarily while considering the width and length of the transistor channel. The proposed circuit performed with 219 ps propagation delay, an average power of 23.99 uW, and a Power-Delay Product of 5.25 fJ. The results indicate that the proposed design offers a potential alternative to circuit designers as it outperforms the Static FAS with Pass Transistor Logic (PTL) XOR, Static FAS with Transmission Gate (TG) XOR, PTL FAS with PTL XOR, and TG FAS with TG XOR.

Career Development Program for Non-Teaching Personnel

Richel Royce T. Chan, PhD, University of Northern Philippines, Vigan City, Ilocos Sur, Philippines

Abstract:--

To realize quality service anchored on the institution's vision and to fulfill its mission and goals, it is essential that its human resources are competent, meet the demands and challenges of the 21st century, they possess the knowledge, skills, and attitudes necessary in the delivery of quality service to the stakeholders. This study evaluated the career development needs of Non-Teaching personnel (NTP) as bases in crafting a Career Development Program (CDP) for them. NTP conduct the utmost importance in the academic work environment as they support and assist in an educational organization's technical side. A CDP was crafted for the NTP that encompasses their entire career life cycle. The program starts from the employees' establishment stage up to their disengagement stage. The CDP's components focused on the NTP's personal, professional, and organizational development needs. This study serves as a tool to provide administrative management direction for the NTP. It will help identify, attract, and retain talented and well-trained staff with a long-term career commitment to a state university.

Keyword: -

Career Development Program, Career Needs, Learning Activities, Non-teaching Personnel

FRMITS: Fluid Replacement Modelling (FRM) Gassmann for Elastic Log Prediction on North Sea Turbidite System using Python-based Software

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Abstract:--

Fluid Replacement Modeling or FRM is a model for estimating changes in Vp, Vs, and density values that occur when saturation changes. FRM modeling requires reservoir depth data, P wave velocity log, porosity and / or density information, shear wave velocity information, saturation, rock matrix, and fluid properties. Many researchers have discussed fluid formulations using the Gassmann equation. However, it is rare for researchers to elaborate in the form of numerical programming. Of course this is very useful, as it can easily be evaluated cross plot models of Ip and Vp / Vs. In this paper, FRMITS is introduced, namely the Elastic Log prediction tool using Fluid Replacement Modeling (FRM) with the Gassmann equation based on the Python programming language. For the sake of demonstration, this paper analyzes well log data from the North Sea Turbidite System, which will be processed and simulated using FRMITS. Based on the demonstration, it can be concluded that FIRMITS performs well in calculating elastic parameters and stress-strain diagrams. From the results of the processing that has been done. we can make some qualitative observations of the crossplot, i.e. shale as a whole is very different from sand so it is potentially easy to identify, brine sand has a higher IP and VP / VS than hydrocarbon carrier sand, the case of oil and gas is not much different from each other, further investigations can be carried out at the overlapping shale intervals with brine sand.

Developing HCI and Design Thinking Methodologies in Education for 21st Century Learners and Beyond

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Constantino, Michelle Anne L, University of the East Graduate School – Manila
Esteban, Michael John B, University of the East Graduate School – Manila

Abstract:--

This study was made with the intention to address Design Thinking as a way to teach and learn with 21st Century Learners. Amidst this globalization, the emergence of modern technology, and Covid-19, educators and students alike are targeting different ways to teach and learn to cater to the remote learning that every part of the world has been doing at the moment. Design Thinking in Education is defined as a non-linear and iterative process that aims to conduct creative problem-solving. The researchers present a developed learning management system and a survey on assessing the acceptance and efficiency of the design thinking methodology that educators may use in these times where learning continues but has become too challenging. This research also aims to show the support needed to be able to apply design thinking towards learning in the future – by building holistic individuals with the ability to solve the challenges based on their individual potentials

Study of Trend of E-Commerce Consumption Patterns in Yogyakarta Millenial Generations in the Pandemic Time of COVID-19

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Abstract:--

The aims of this study: (1) to analyze the trend of consumption patterns of Millennial Generation in marketplace products; (2) factors that influence the choice of the Yogyakarta Millennial Generation in consuming products in the marketplace. To answer the objectives of the first study, namely by using statistical frequency analysis, the second objective of the study used the logistic regression method, and the third objective of the study was using the Ordinary Least Square (OLS). Currently, urban communities in Indonesia have a very strong involvement with the existence of the internet. Almost every activity involves the internet and information technology. This phenomenon also ultimately encourages the growth of empowerment in the business sector that uses the internet as the main platform, in almost all regions in Indonesia including Yogyakarta. The Indonesian Internet Service Providers Association (APJII) states that internet users in Indonesia amounted to 171.17 million in 2018 or around 64.8% of the total population in Indonesia using the internet (BPS, 2018). Internet users in Yogyakarta are quite high at 26.3%. One of the causes of this high number is the demographic factor of Yogyakarta which is known as a city of students, causing the increasing number of internet users in Yogyakarta.

Keywords:

Millenial Generations, Consumption, Marketplace, E-Commerce

Multilayer Security for Facial Authentication to Secure Text Files

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Ruji P. Medina, Technological Institute of the Philippines

Abstract:--

Steganography and Cryptography both provide data security, and when used together, it will result to more robust protection. However, one of the studies found that 95% of data breach incidents relate to human error, such as failing to keep information safe, and using weak passwords. This data breach is the challenge when using Cryptography as it needs a key for encryption and decryption that must be kept and remembered. This study utilized multi-layer protection to secure a text file using face authentication with AES 128-bit and LSB. With this, users do not need to remember and store their passwords because the face authentication would automatically generate a password for them. This includes a face anti-spoofing technique to identify real and fake faces and overcome spoofing attacks. LSB was used to hide the secret text. The face authentication performance was measured using the False Acceptance Rate (FAR) and False Rejection Rate (FRR) to determine its accuracy. The FRR and FAR results of 0.1% show that the system can successfully detect an image's authenticity. The AES 128-bit ciphertext takes 12 septillion years to be successfully analyzed using the brute-force attack. Furthermore, the imperceptibility of LSB stego-image obtained 0.48 and 51 dB, respectively, using Mean Square Error (MSE) and Peak Signal-to-Noise Ratio (PSNR). In addition to these, the MD5 was used to convert the generated password into a more complex and stronger cipher key.

Study of Thermo - Physical Properties of Ganoderma Lucidum

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Doan Thanh Son, Van Lang University, Ho Chi Minh City, Vietnam.
Nguyen Quang Sang, Van Lang University, Ho Chi Minh City, Vietnam.

Abstract:--

This study proposed an optimum predicted drying conditions for radio frequency (RF) assisted heat pump (HP) drying of Ganoderma lucidum. In which, three levels of three independent variables as drying air temperature, drying air velocity and RF power were optimized to obtain the maximum yield of Polysaccharide content and minimum yield of drying time using response surface methodology (RSM). Box–Behnken design (BBD) was employed to evaluate the effects of drying air temperature, drying air velocity and RF power on drying time and Polysaccharide content in Ganoderma lucidum. The optimum predicted drying conditions were determined as the drying air temperature: 47oC, the drying air velocity: 1.53 m.s-1 and RF power: 1.61 kW. Under these modified conditions, the yield of Polysaccharide content and drying time achieved were 9.39 mg.g-1 and 409 minutes.

VoIP Codec Performance Evaluation on GRE with IPsec over IPv4 and IPv6

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Abstract:--

One of the significant concerns of voice communication over Internet Protocol is security. However, Voice over Internet Protocol is a better replacement for plain old telephone service, yet not without some drawback and security challenges. Voice over IP has a time-sensitive quality of service requirements such as delay, jitter, and packet loss which determines the quality of voice calls in Voice over IP. Incorporating IPsec encryption and authentication can degrade the QoS requirements, raising concerns on performance and reliability. Consequently, this study investigates the codec that efficiently stabilizes between recommended delay, jitter, and packet loss on GRE with IPsec over IPv4 and IPv6. The experiment was performed using GNS3 Simulator for topology design and device configuration. Distributed Internet Traffic Generator was used to generate voice traffic using three different voice codecs. The result of the experiment shows that the G.723.1 codec gave a superior performance on GRE with IPsec over IPv4 and IPv6. The result further proved that the choice of codec plays a significant role in VoIP IPsec deployment.

THE IDENTIFICATION, HOST RANGE AND HOST PREFERENCES OF CUSCUTA SPECIES OF KARAK, KOHAT AND BANNU DISTRICTS

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Nisar Ahmad, Kohat University of Science and Technology, Kohat, Pakistan
Amir Sultan, National Agricultural Research Center Islamabad, Pakistan

Abstract:--
It was observed that there were two species of Cuscuta at the three districts i.e *Cuscuta reflexa* and *Cuscuta campestris*. Cuscuta Species were widely distributed in Bannu. However it was also found in scattered patches in district Karak, while it was noted to parasitize least number of hosts in Kohat. A total of 20 plants species belonging to 15 families and 19 genera were observed as the host plants of this holo-parasite in the three districts. In the light of Shannon Weiner Index Software we concluded that *Ziziphus spina-christi* and *Parthenium hysterophorous* stayed to be the primary hosts of *Cuscuta reflexa* and *Cuscuta campestris* among the three districts respectively. The susceptible weeds sustained dodder growth until fruiting of the parasite and therefore classified as the most highly preferred hosts. Asteraceae was the most susceptible family infested by *Cuscuta campestris* while Rhamnaceae was the most susceptible family infested by *Cuscuta reflexa*

Index Terms—
Cuscuta, Parasitic Angiosperm, Host range, Diversity

Worksheets in Practical Research 2 Used by Technical, Vocational and Livelihood Students of Mangaldan National High School

Analyn I. Diola, Teacher 2-STEM, Mangaldan National High School, Schools Division of Pangasinan II

Abstract:

Research is one on the feared subjects. Many students in the Senior High School are working. Few were into family and personal problems. Often, they incur absences. As a solution, Worksheets are made by the Researcher and utilized by the Technical Vocational students in Practical Research 2. Most of the time, this was sent by the Teacher thru Facebook messenger. Worksheets are proven to be effective as a driving force of education. Now, an evaluation is conducted on the acceptability of the Worksheets. Reflection journal written by the students was examined. Survey was also conducted to determine the acceptability of the Worksheets in terms of clarity, content, teacher-related aspect and student-related aspect; the advantages, disadvantages, difficulties and changes to be made, and the overall reaction of the students on the Worksheets. As a result, the Worksheets are rated as good in terms of clarity, content, teacher-related aspect and student-related aspect. Worksheets made the writing of each research chapter easier. But because Worksheets are provided, being absent in class turned okey for students. There were difficulties in answering the Worksheets due to directions and language used. It was suggested that explanations shall be provided on each Worksheet. There were positive overall reactions on the Worksheets. Therefore, it is concluded that the Worksheet can be continually utilized but with the major changes to be incorporated on the content as well as the manner of dissemination.

Keywords:

Practical Research, Worksheets, evaluation of Worksheets

A Review on Prediction of Diabetes Type 2 by Machine Learning Techniques

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Sanjay Silakari, Department of Computer Science and Engineering, University Institute of Technology, RGPV, Bhopal, India

Abstract:
Machine learning is considered to be one of the most promising tools when it comes to working with heterogeneous data. It provides a new dimension which enables one to extract relevant data and take decision for the effective functioning of the network, making use of network generated data. Every sphere of our life is now dependent on machine learning. It has flourished in every dimension. Making it versatile and ever demanding. Department of healthcare contains very abundant and sensitive information which is needed to be carefully handled. Diabetes mellitus is increasing exponentially and is spreading like anything in the world. A reliable prediction system should be present for diagnosing diabetes. Variety of machine learning techniques find their use in the examination of data from variant perspectives and summarizing it into effective information. Usage of new patterns is done to elucidate these patterns in order to deliver relevant information for their users. By making use of techniques such as SVM, random forest, logistic regression, naïve bayes etc the prediction of diabetes can be done easily and accurately. In this study we will make use of different machine learning techniques and try to find accurate prediction regarding the same.

Keywords :
Machine learning, diabetes type 2, supervised, unsupervised, reinforcement, training and algorithm.

Telecom Churn Prediction Using Deep Learning Methods

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Ajay Khunteta, Poornima University, Jaipur
Sumit Shrivastava, Poornima University, Jaipur

Abstract:

Customer churn is a major problem across traditional and new age companies like telecom, digital services providers, online marketplace, payment banking and social media companies. Customer churn means customer is moving out from the company, hence impacting the top line of financial sheets. This is particularly more relevant for companies having subscription-based plans. Telecom industry which has sizable customer base and cut throat competition is at higher risk of impact due to churn. With the customer database size running into petabyte and terabytes, it is a tedious and time taking task to accurately predict customer churn based on some random logic. While machine learning appears to be an easier alternative, often such database contains large number of string attributes that are tough to use in machine learning algorithms. Various traditional machine learning and datamining techniques have been applied for handling such big data. All such techniques have leveraged different techniques for data engineering. In this study we have demonstrated how a new and powerful technique Convolutional Neural Network with Variational Auto Encoder can help predict churn with higher accuracy. CNN automatically have the ability of good feature selection and representation of input data and this study has embedded the functionality of using all existing string variable of database helping in enhancing model performance. Experiment is done on three telecom companies Cell2Cell, Telco and Orange datasets of size 51048, 7048 and 3333 respectively. Model outperformed on all three datasets and achieved a good accuracy level. ISAD model helped to enhance the performance by giving more feature option for predicting the customer behavior correctly.

Spatial Analysis of Shoreline Changes in Coastal Of Balikpapan Bay, District East Kalimantan

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Hendrawan, Laboratory of Marine Technology, IPB University, Indonesia
Emil Azmanajaya, Balikpapan State Polytechnic, Indonesia.
Syahruddin, Balikpapan State Polytechnic, Indonesia.

Abstract:

Shoreline change is a process that occurs due to the influence of coastal conditions in achieving balance with the impacts that occur from natural factors and human activities. Geographically, the coastal area of Balikpapan Bay, East Kalimantan, includes three major rivers, namely the Wein River, the Riko River, and the Sepaku River. Physically, this area is influenced by the oceanographic dynamics of the waters of the Makassar Strait as well as the Wein, Riko, and Sepaku rivers which vary seasonally. This study aims to analyze shoreline changes in the coastal area of Balikpapan Bay, East Kalimantan. The data used are Landsat imagery 8 in 2019 to describe the current conditions and Landsat imagery 5 in 2007 as initial conditions. The image is analyzed to map changes in the shoreline that experience accretion or abrasion. The research results show that the coastline of the study area has experienced changes, where some have experienced abrasion and some of the coastlines have experienced accretion. Overall the coastline of Balikpapan Bay experiences dominant accretion compared to abrasion due to high sedimentation processes from the Wein, Riko, and Sepaku rivers. However, several segments of the coastline have experienced abrasion, including the Jenebora, Kariangau, and Kemala beach Balikpapan, this is thought to be due to the reduction in mangrove forest area due to the conversion of forest functions to fish ponds, settlements, and industrial areas, resulting in forest population density mangroves have reduced their function as a barrier to waves.

Index Terms

Abrasion and acresion, Landsat Citra, Balikpapan Bay, Sheroline Changes

A Review on the Concept of Link Road

Shehryar Sarwar Rana, Civil Engineering Department, Capital University of Science and Technology, Islamabad, Pakistan
Muhammad Usman Farooqi, Civil Engineering Department, Capital University of Science and Technology, Islamabad, Pakistan
Dr. Majid Ali, Civil Engineering Department, Capital University of Science and Technology, Islamabad, Pakistan

Abstract:

This paper reviews the concept of link road its importance, issues, benefits under sustainable aspect of geometric design and its efficiency based on social and environmental factors. Different researches both new and old were studied to get a complete understanding on a concept of link roads. The sustainability of the road network has become increasingly critical Problem in recent times, as the value of time has increased considerably and unforeseen delays can result in significant losses for road users. Road Network reliability has now become a significant indicator of success for evaluation of road networks. The study on these parameters is necessary to investigate the needs for an overall concept of link road.

Index Terms

Link Road, Environmental & Social Aspects, Sustainability

Development and Implementation of Seawater Energy Harvester with Arduino-based Monitoring System

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Abstract:
This research aims to develop and implement a seawater energy harvesting system (SEHS) with Arduino-based monitoring system. Several electrode configurations involving magnesium, graphite, aluminum, zinc and copper were utilized to identify a suitable configuration for further application. The magnesium-graphite configuration, with a peak voltage output of 1.6V, was identified as the most suitable configuration. The relationship of water's salinity and volume to the output of the SEHS were determined in this research. After performing sufficient tests and evaluations, it was determined that the water's volume and salinity are directly proportional to the SEHS output. The magnesium-graphite electrodes were installed into the SEHS and the prototype was implemented by using actual seawater samples from Naic and Ternate, Cavite as its electrolyte. The peak current output of the SEHS ranged from 9-23 mA for the Naic seawater electrolyte. On the other hand, the current output of the SEHS ranged from 13-35 mA for the Ternate seawater electrolyte. The Arduino monitoring system was utilized under both wired and wireless conditions to determine its accuracy.

Index Terms—
Seawater Energy Harvesting System (SEHS), Electrochemical reaction, Electrodes, salinity, volume, Arduino

Evaluation of Philippine Waste Rice Hull Ash as Alternative Filler in Ceramic Body Formulations

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Abstract:

Rice hull ash (RHA) is a by-product of burning rice hull and is known to have high silica (SiO_2) content. SiO_2 is very essential material in many industries where mined quartz is commonly used as source. In this study, RHA as alternative filler to quartz in ceramic body formulations were evaluated. Typical porcelain body formulation was prepared from local raw materials such as kaolinitic clay (50 wt. %), soda feldspar (25 wt. %), and quartz (25 wt. %) as the control parameter. Five formulations with varying ratio of fillers where quartz was substituted by RHA (amorphous) from 5 to 25 wt. % were also prepared and evaluated. All specimens exhibited promising physical properties but specimens consisting 10 wt. % RHA showed at par for porcelain body application. Furthermore, scanning electron microscopy images of the cross-sectioned specimens revealed the presence of large pores and large bundles of mullites formed at the surface of the control specimen while interconnecting pores and mostly whisker-like with some bundles of mullites are evidently seen in the surface of the specimen with 10 wt. % RHA in the formulation.

Structure and Morphology of Nanocrystal from Carbon Black Banana Skin Waste

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Abstract:

The adsorbent material is activated carbon or amorphous compound which is produced from materials containing carbon or charcoal which are specially treated to obtain high adsorption power. Activated carbon can adsorb gas and certain chemical compounds or the nature of the adsorption selectively, depending on the size or volume of the pores and the surface area... In this case, the activated carbon from banana peel waste is then characterized by XRD and SEM to find out and see the crystal structure and morpholgy. The result is that the structure of the waste powder of banana peels is crystalline rather than amorphous. The phase composition contained in 3 peaks from banana skin powder samples is Carbon (52) as much as 65.5% and the rest are Silicate (50) and Potassium (46). The crystalline size of the nanometer-sized banana peel powder is 4.93 - 10.9nm for peak peaks which have the highest size of FWHM Carbon banana peel carbon powder has uniform morphology. The morphology of the particles formed is still micro-sized, namely the average of each sample is 40 micro, which is about 40,000 nano. Waste of banana peel has a high level of moisture to the outside environment so that agglomeration or clumping occurs in the surface morphology of the sample. The longer the stretching carried out during synthesis, the samples produced have a more even surface evenness

Index Terms-

Carbon, Morphology, Crystalline Size, Agglomeration, Crystalline

An Overview of Pipe Bending Methods for the Development of a Rotary Compression Pipe Bending Mechanism

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Abstract:
This paper presents an overview of the work done by earlier researchers pertaining to pipe bending. Exhaustive literature review is carried out with the intention to know various methods of pipe bending and defects produced therein. After review, it was learnt that that nobody has worked on rotary compression bending mechanism. Moreover, pipes of different diameters and various thicknesses are not attempted. If variation of the dimensions of the pipe is to be incorporated, multiple form dies are required to accommodate different pipe diameters. This review will facilitate the development of a simple and automatic pipe bending mechanism, which will exercise a control over ovality and thickness variation which are major defects in the bent portion of the pipe. It can be concluded that a equipment is to be developed for different outside diameters of pipe and effectiveness of the developed equipment is to be ascertained experimentally.

Keywords:
Pipe Bending, Defects in pipe bending, percentage ovality, thickness variation

A Framework and Approach for Knowledge Management Implementation between TVET and SMEs

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Abstract:

Knowledge Management (KM) is known as one of the most encouraging and propelled apparatuses that can add to the production of a practical upper hand for business today which presents the most significant upper hand factor for associations. The researchers focus and centers around KM's issues and the likelihood to execute KM between Technical Vocational Education and Training (TVET) and Small and Medium Enterprises (SMEs) in Ethiopia. There has been no investigation directed up to this date, on the execution of KM concerning information move, catch and application among TVET and SMEs. The primary objective of this exploration in this manner, is to give the peruser an idea of the SMEs that participate in the advancement of structure for information the executives framework usage of TVET organization in Ethiopia. The KM coming about procedure would assume and significant job in innovation move as a major aspect of the business administration augmentation of TVET to the SMEs by giving a situation in a type of ICT devices, for example, shared data framework, bunch emotionally supportive network or learning the executives framework. A Design Science Research (DSR) was embraced which is broadly utilized in data frameworks research to take care of complex issues. The KM procedure the streams from TVET to SMEs and the other way around is done through KM framework instruments with the recognized innovations like Documents Management System, Collaboration System, eLearning framework, Technology Transfer Information framework, Web 2.0 and Big Data Analytics Tools. With the relationship of KM culture, methodologies, learning and coordinated effort condition, KM innovations and apparatuses with its supporting foundation and registering, these procedure and structure upgrade successfully and effectively the information the board execution and procedure inside the limit of instruction industry linkage.

Index Terms

Knowledge Management, Knowledge Sharing, Technology Transfer, TVET, SMEs.

Early Landslide Detection and Warning System in a Controlled Environment using DIY Landslide Simulator

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Abstract:
The Philippines, visited by 20 typhoons a year according to PAGASA and about 100-150 earthquakes per year according to PHIVOLCS. It sets a problem as the Philippines' terrain is mostly of mountains, which causes landslides and earthquakes to occur that results in a significant loss of lives, disruption of roads, and increased risks of floods. This paper presents a warning system that measures soil moisture, soil vibration, and rainfall, setting the threshold that sends alert messages to assigned personnel, buzzer and light indicator on the primary device and forwarding it to citizens. With Lora WAN technology, it transmits messages within 250 Meters away from the control room. It can stand alone even when the cell towers are down, unlike GSM that is cell tower dependent due to heavy rainfall. The warning system used sensors developed by DIY Landslide Simulator using 12V Cordless drill o by applying the formula of log10(PGA) = 0.2526MMI – 3.1006 that can produce up to 2.5g of acceleration or intensity level 10+ from the Modified Mercalli Intensity Scale. To set the threshold of gravimetric water content not less than 47% that could produce a landslide, which will trigger the early warning system mechanism with a PGA above 0.2523g and a rain gauge with a below 2% of the difference from the manual rain gauge. A solar-powered device will produce a self-sustained of 2271 mAh of charging to survive until daylight comes.

Keywords
Warning System, Landslide, Lora WAN, DIY Landslide Simulator.

Advanced Expansion in Kernel Principle Component Approach for Face Recognition

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Abstract:
Face recognition has existed for quite a long time considered to be the defender among the most basic contrary to other biometric based frameworks. Facial recognition cycle can be communicated as a pursuit. Database of many known facial photographs Personal, one of the wellsprings of facial photographs, and program is designed to identify or determine Personal information picture. In situations where facial details may not be available, everything establishes an identity. Be that as it may, the face is the most characteristic, widely utilized key for an individual's identity. The issue of automatic facial recognition [1] involves three important advances: 1. Discovery rough standardization of faces 2. Extraction of highlights and precise standardization of faces 3.Identification or confirmation.

Keywords
Advanced kernel, Principal components Analysis, PCA, AKPCA, Face recognition.

Management of Energy Consumption Using Programmable Logic Controllers (PLC's)

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Abstract:
The implementation of efficient energy systems is considered as one of the most important requirements in modern building. The purpose of these systems is to regulate energy consumption and meanwhile to reduce the negative impact on the surrounding environment through an efficient management of available energy resources, including renewable and nonrenewable resources. The integration of mains power supply with the solar power supply, besides other energy resources is a key element in designing the required energy management system.

In this paper, the usage of Programmable Logic Controllers (PLC's) is proposed to control the energy consumed by various loads in the building based on real-time measurements of certain factors affecting the total amount of consumed energy. Hence, this paper presents a real time prototype design and implementation of an automated control system of mains electricity power distributed to various loads, using Allen Bradley MicroLogix 1100 Programmable Logic Controller (PLC). The PLC is programmed using ladder diagram for intelligent switching of both solar power supply and diesel generator power supply units. Also, it is programmed in order to prioritize the usage of the available solar energy as much as possible. The Rockwell Software Logix 500 is used for programming a PLC, running on a host computer terminal. For completeness, the control program results are compared with a hardware interfacing module.

Keywords:
Energy Consumption, Energy Efficiency, Programmable Logic Controllers, PLC's.

Identification of Problems in Constructing Strategies for The Development of The Palm Oil-Based Biohydrocarbon Industry using SWOT Analysis

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Abstract:
Efforts in developing biofuels for substituting diesel oil has been increasing in the past two decades. Indonesia currently plan to develop B40 and B50. The development of biofuel is part of the country's effort to lower GHG emission and also to attain national energy security. The biofuel being developed has to have similar characteristics to diesel fuel. The type of biofuel to be developed in Indonesia is called bio-hydrofined diesel oil (HDO) which can be produced from palm oil. The development biofuel industry is envisaged to have to deal with various obstacles. The design of comprehensive biohydrocarbon industry development strategy requires a comprehensive strategy analysis. The methodology to be used in developing the strategy is SWOT analysis. This method is used to identify Strengths, Weaknesses, Opportunity, and Threats factors that are the constraints and the drivers of biohydrocarbon development. From the SWOT analys of Indonesian biofuel industry development it was found that the Strength factor, availability of raw material sources (25%) is the main factor while the Weakness factor of land availability is not 'unlimited' (24%) is the major factor. The main Opprtunity and Threat factors are respectively reducing imports (24%) and the demands of the world community on sustainable palm oil (25%). By using the weighting of each factor, the average score is obtained which describes the position of the contribution of the biohydrocarbon industry is currently in a more dominating Threat position (3.40) than Opportunity (2.34), the Weakness position is slightly higher (3.37) than Strength (3.19), while the target average score is Strength 4.86; Weakness 2.26; Opportunity 4.57; and Threat 1.71. The position of the contribution of the biohydrocarbon industry is currently in quadran III (1.05; -0.18). To get to the targeted conditions which are in quadrant I (2.86; 2.60). Thus, the current SWOT position (Quadrant III) can be changed to the ideal SWOT position (Quadrant I) through various strategies supported by related policies.

Keywords:
biofuel, bio-HDO, biohydrocarbon, energy security index, crude palm oil, renewable energy, SWOT analysis

Simulation of Diffuser for Horizontal Axis Wind Turbine using Computational Fluid Dynamics

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Abstract:
As a renewable energy, wind energy becomes one of the promising energy technologies. Most wind turbine technologies are designed at high speeds which are not effectively operated in areas with low wind speeds. Therefore, an effective technology to enhance the possible use of wind energy at low wind speeds is needed. The concept of Diffuser Augmented Wind Turbine (DAWT) has been used recently to improve the use of wind turbine in a low wind speed area by manipulating the wind speed. The pressure difference between inside and outside of the diffuser is generated which might enhance the wind velocity; hence, the power is increased. In this paper, simulation using ANSYS was conducted to investigate the performance of Horizontal Axis Wind Turbine (HAWT) in low wind speed area applying DAWT technology by modifying the angle of the diffuser. The variation of the diffuser angle was in the range 4-16o and the diffuser length to diameter (L/D) is 1.25D. The simulation results showed a good agreement with the reference literature which obtained the increased power around 1.2-1.7 times higher than the non-diffuser wind turbine.

Keywords:
wind energy, diffuser augmented wind turbine, simulation

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