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# 36th World Conference on

## Applied Science, Engineering & Technology

**29th & 30th July 2021**

**Bangkok, Thailand**

# WCASET-2021

ORGANIZED BY

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# 36th World Conference on Applied Science, Engineering and Technology


## 36th WCASET-2021
## Virtual Conference

**29th & 30th July, 2021**

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# Editorial

We cordially invite you to attend the **36th World Conference on Applied Science, Engineering and Technology (WCASET - 2021)** which will be held on **29th & 30th July, 2021** - Virtual conference. The main objective of **WCASET-2021** 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 there view process, and to the authors for contributing their research result to the conference.

Since May 2021, the Organizing Committees have received more than 130 manuscript papers, and the papers cover all the aspects in Electronics, Computer Science, Information Technology, Science Engineering and Technology. Finally, after review, about 72 papers were included to the proceedings of **WCASET-2021**.

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of **WCASET-2021**. 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 **36th World Conference on Applied Science, Engineering and Technology** this year in month of July. The main objective of 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.

**Er. R. B. Satpathy**
**CEO (Chief Executive Officer)**
**Institute for Engineering Research and Publication (IFERP)**

# Keynote Speakers

**Nir Kshetri**
Professor, Bryan School of Business and Economics,
The University of North Carolina,
Greensboro, USA.

**Prof. Dr. Raj Kumar Singh**
Professor, Dean (Research & Development),
HOD (Department of Commerce), School of Management Sciences,
Varanasi India

**Prof. Dr. Rashmi Gujrati**
Professor & Dean,
Tecnia Institutes of Advanced Studies,
New Delhi, India.

**Dr. Pokkuluri Kiran Sree**
Head & Professor, Department of CSE,
Shri Vishnu Engineering College for Women(A),
Vishnupur, Bhimavaram, W.G,A.P,
Andhra Pradesh, India.

# 36th WORLD CONFERENCE ON APPLIED SCIENCE, ENGINEERING AND TECHNOLOGY

## 29th & 30th July, 2021

**- Virtual Conference**

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# 36th World Conference on Applied Science, Engineering and Technology

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# ABSTRACTS

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36th World Conference on Applied Science, Engineering and Technology

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# Readiness and Perception of Faculty towards Online Crisis Teaching during Covid-19 Outbreak: A Study of Lebanese Institutions of Higher Education

**Dr. Nessrin Shaya,** Assistant Professor, American University in the Emirates, College of Education

**Abstract**

The study reports on higher education faculty readiness for online teaching and learning following the outbreak of Covid-19 virus in Lebanon and the transition to virtual learning environments, using Assessment of Faculty Readiness to Teach Online scale. The survey explored faculty acceptance of online education and how effective are the adopted pedagogical practices with online learning environments. Mixed method research approach was employed to generate a comprehensive final study model on key findings framed under prospects and barriers. Responses implied adequate levels of readiness to teach online, yet, requiring intervention to excel in online teaching, despite familiarity with the use of course management system and online discussions to support teaching, slightly positive perception that online education is as rigorous and efficient as face-to-face instruction. Thematic analysis led to an emergent status of faculty perception towards online education were prospects lie in recognizing online teaching as a catalyst for higher education pedagogy reform, confidence in use of technology, perceived usefulness for students pertaining to interpersonal development, career-life balance and access to education, while barriers emerged as doubts in the technological infrastructure of some institutions, students' self-regulation skills, program applicability and job relevance.

**Keywords**

Faculty Readiness, Acceptance, Online Education, Pedagogy, Higher Education, Prospects, Barriers.

# Effectiveness of Science Strategic Intervention Material in Elevating the Performance Level of Grade Seven Students

**Aurea G. Bonitez,** MAT, Ed.D (c), Teacher III, San Mateo National High School, San Mateo, Rizal, Philippines

**Abstract**

Education is geared toward meeting the needs of youth. Young students are discovering their strengths and building their dreams for the future. They're growing up physically and mentally and beginning to understand themselves and the world around them. As educators, we should give the quality education, which is a venue for a strong foundation of knowledge, to meet their dreams.

Education also develops the talents and skills of our youth, who will be leading countries and the world in the next generation. And we, as educators, want to nurture students' physical prowess, mental acuity, and social graces. Educations' responsibility is to develop and train the thinking skills of students needed to pursue their dreams and make a better society. As educators, it is our role to help and give students the basic skills in core subjects like Language, Mathematics, Science, History, and the Arts.

In learning and teaching process, problems always occur. Intellectual ability, attitude of the students toward studies and the strategies used by the teacher in teachings are some of the factors that should take in consideration. In such conditions like these, there is a need for an intervention material, which will help solve the problem in learning and teaching process. Strategic Intervention Materials, popularly known as SIM in Philippine Education, is an instructional material meant to reteach concept or topics, which are considered Least Mastered by the students. The basic parts of which are Guide Card, Activity Card, Assessment Card, Enrichment Card, Answer Card, and Reference Card.

The purpose and goal of SIM is to encourage students' interest, learn Science concepts and skills, and apply learned skills and concepts into real life situations. SIM is believed to be an effective strategic teaching and for teachers in carrying out objectives on least learned lessons.

SIM learning strategies are teaching tools that help students understand information and solve problems effectively and efficiently. Strategic Intervention Material Learning Strategies have the necessary breadth and depth to provide a well-designed scope and sequence of strategy instruction.

Strategic Intervention Materials are instructional materials that meant to teach the concept and skills. Materials are given to students to help them master a competency based skill, which they are not able to. It also increases and deepens students' skills in manipulation, and knowledge or thinking, understanding and observing the microscopic into macroscopic representation of matter like that of atoms, molecules, and ions believe as a discrete representation of the existing matter and other related components of science



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# Time Series and Machine Learning Methods for Forecasting International Tourist Arrivals from Main Countries to Thailand

**Naragain Phumchusri,** Department of Industrial Engineering, Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand

**Ontheera Hwandee,** Department of Industrial Engineering, Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand

## Abstract

In order to achieve effective marketing and resource planning, accurate forecasting of tourist arrivals from major countries to Thailand is necessary for Thai tourism industry. In this paper, various forecasting models are explored to forecast monthly tourist arrivals from China, Malaysia, Korea, Japan, Russia, UK and US. The proposed models include both time series models, i.e., SARIMA, Holt-Winter, and explanatory models, i.e., Multiple Regression and Feed Forward Artificial Neural Networks (FANNs). Economic factors such as income, relative price, exchange rates, and dummy variables of seasonality and news shock effect are explored to understand their effects on international tourism demand. Mean absolute percentage error (MAPE) is used for model comparison. It was found that the more advanced model like FANNs can produce high levels of forecasting accuracy (with MAPE $\leq$ 10% for all studied counties) and outperform simpler forms of explanatory model like Multiple Linear Regression. However, there are counties such as US and Japan that are suitable for Holt-Winter and SARIMA, respectively, due to their obvious seasonality and trends. This comparison between time series models and machine learning models for monthly tourism demand has never been done in previous literature.

## Keywords

Tourist Arrivals Forecasting, Multiple Regression, Seasonal ARIMA, Artificial Neural Networks

# Design of Business Intelligence System for Point-of-Sales Software in Full-service Restaurants

**Naragain Phumchusri,** Department of Industrial Engineering, Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand

**Lalida Chunhasomboon,** Regional Centre for Manufacturing Systems Engineering, Chulalongkorn University, Bangkok, Thailand

## Abstract

Small and Medium-sized restaurants are faced with increasing competitions due to the rise of food reviews and food delivery mobile applications which increase accessibility and customer demands. In order to thrive in this competition, restaurant owners seek to know their performance beyond sales number as there are other aspects of restaurant management such as operations efficiency, inventory, and quality of service. However, the current offerings by various POS in the market do not provide such performance measures, making it difficult for owners to know and improve other dimensions of restaurant management. As a result, the aim of this paper is to identify the gap to fulfill this need and also an opportunity to provide a new value proposition to users, attracting new users and retaining existing ones for a case study company who provides point-of-sales software service in Thailand. Business intelligence (BI) system with a dashboard is presented in this paper, in which there are 3 main components in BI system to design: Key Performance Indicators (KPIs), dashboard display, and data warehouse. Balanced Scorecard is used for KPI selection; data relationships and chart types are used to determine appropriate display media, and lastly dimensional modelling is used to design data warehouse. Evaluation is performed by a non-parametric test to gain insights and satisfaction results by 20 restaurant owners/managers who are the current clients of the case study company. Useful insights from clients are also used to improve our design in the final version.

## Keywords

Performance Measures, Restaurant Management, Balanced Scorecard, Data Visualisation, Dashboard, Business Intelligence



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# Mini Industrial Robotic Arm (MIRA) Learning Package

**Kengie E. Merenciano,** PhD, Bicol University College of Industrial Technology, East Campus Legazpi City, Philippines

**Abstract**

This study was conducted for the purpose of designing and evaluating the MIRA Learning Package as an alternative learning tool and a robotic simulation technology solution in providing a set of experience to facilitate the student's learning development experience for STEM Education. The study used the Descriptive and the Design methods of Research. The Design method was used in the construction of a functional prototype, designed specifically to serve as an industrial-like robotic manipulator training kit for students' simulation exercises. Descriptive method with the use of a questionnaire was used in the analysis of the data gathered. The analysis of data revealed the findings that the Mini-Industrial Robotic Arm (MIRA) Learning Package is an innovative educational platform aimed at providing diverse learning experiences to facilitate student's acquisition of knowledge, skills and attitude for the design, analysis, application and operation of a robot arm. Instructional Manual serves as the students' guide in learning the concept of robotics and its application in other STEM related subjects

**Keywords**

Automation, Industrial Robotic Arm, Mechatronics, Robotics, STEM Education

# Near Infrared Hyperspectral Imaging for Predicting Quality of Dehydrated Ginger

**Wayan Dipasasri Aozora,** B.Sc., Department of Food Science, Faculty of Food-Industry, King Mongkut's Institute of Technology Ladkrabang, Chalongkrung Road, Ladkrabang, Bangkok, Thailand

**Dr. Sontisuk Teerachaichayut,** Associate Professor, Department of Food Process Engineering, Faculty of Food-Industry, King Mongkut's Institute of Technology Ladkrabang, Chalongkrung Road, Ladkrabang, Bangkok, Thailand

**Abstract**

The quality of any food products processed from fruit and vegetables can vary depending mainly on the quality of raw material and their processing. Near infrared hyperspectral imaging (NIR-HSI) has been shown to be a reliable and effective method of online monitoring of food products and was therefore tested on dehydrated ginger. The quality parameters of the dehydrated ginger assessed were hardness and total soluble solids (TSS). The models for hardness and TSS were established using partial least square regression (PLSR). Spectral pretreatments were investigated in order to improve precision of the models. The accuracy of the prediction models for hardness was achieved correlation coefficient of prediction (Rp) of 0.79 and root mean square error of prediction (RMSEP) of 3.13 N and for TSS was Rp= 0.82 and RMSEP= 2.25%. Results showed that NIR-HSI has potential for determining hardness and TSS of dehydrated ginger non-destructively and could possibly to be used as part of the production process for online grading in dehydration factories.



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# Nondestructive Prediction of Juice Recovery Yield of Pineapple Using Near Infrared Hyperspectral Imaging

**Achiraya Tantinantrakun,** Department of Food Science, Faculty of Food-Industry, King Mongkut's Institute of Technology Ladkrabang, Chalongkrung Road, Ladkrabang, Bangkok, Thailand

**Sontisuk Teerachaichayut,** Department of Food Process Engineering, Faculty of Food-Industry, King Mongkut's Institute of Technology Ladkrabang, Chalongkrung Road, Ladkrabang, Bangkok, Thailand

**Abstract**

During commercial processing of pineapples, fresh fruit selection on the basis of their quality is essential, particularly their juice content. This is to ensure high and consistent product quality, but juice level varies between individual fruit. Therefore, a non-destructive technique for predicting juice recovery yield of pineapple using near infrared hyperspectral imaging (NIR-HSI) was aimed for use in online sorting systems. Pineapples were scanned using NIR-HSI to develop a calibration model for predicting juice recovery yield of pineapple in this study. A set of 122 pineapple samples was divided into a calibration set (n = 81) and a prediction set (n= 41). Spectral pretreatments were investigated in order to obtain the best calibration model. The best model was obtained using Savitzky-Golay smoothing spectral pretreatment at the wavelength range of 935–1720 nm using partial least squares regression (PLSR). The model showed sufficient accuracy for prediction with a correlation coefficient (Rp) of 0.73 and the root mean square error of prediction (RMSEP) of 1.54%. These results indicate that NIR-HSI has the potential for use in prediction the juice recovery yield of pineapple in a non-destructive online system in pineapple processing factories.



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# A Review- Empirical based Prediction of Beam-Column Joint Shear Strength

**Ravikumar S,** Research Scholar, Pondicherry Engineering College, Pondicherry, India

**Abstract**

In reinforced concrete framed structures, beam-column joints are more vulnerable to failure under subject to lateral forces such as earthquake and wind loads. Beam column joints are classified two ways first one is based on location in the frames are interior, exterior and corner joints. The beam-column joints were in failure predominately by shear. In this review paper, all the empirical-based research on prediction on joint shear strength model developed by various researchers and discussed their limitations. An experimental database was developed from the previous research on exterior beam-column joints—the empirical-based joint shear strength models calculated with an experimental database. On comparisons, significant difference identified between among various models predicted joint shear strength with experimental results.



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# Conversion, Simulation, and Engine Testing of a Single Cylinder Port-fuel Injected (PFI) Atkinson Cycle Engine Based on an Otto Cycle Engine

**Jose Luis L. Villalon,** School of Graduate Studies, Mapua University, Manila, Philippines

**Abstract**

Downsized ICEs have been widely used for various applications worldwide. One of the feasible methods in improving engine efficiency and consumption is applying an Atkinson cycle engine. This research aimed to convert a single-cylinder Otto cycle engine that will accomplish an Atkinson cycle effect by modifying the intake cam timing and compression ratio. A wheel dynamometer was built to analyze the engine's baseline performance and behavior. The engine modification underwent a two-part CFD-1D simulation with a GA optimization strategy to obtain baseline performance and design improvements. It was found that the engine modification with the optimized fuel mapping significantly reduced the average BSFC by 36.07% at 3000rpm range, 8.58% decrease at 5000rpm range, and 14.9% decrease at 8000rpm range. The corresponding engine power resulted in a 68.93% increase at the 3000rpm range, 1.76% decrease at the 5000rpm range, and 3.49% decrease at the 8000rpm range.



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# Production and Enterprise Development: Its Perspectives towards Commercialization

**Anna Liza Mendrique-Mateo,** DBA, College of Arts and Sciences, Bicol State College of Applied Sciences and Technology, Philippines

**Debbie Abiog-Adriano,** DBA, Graduate School/College of Business and Accountancy, Ateneo de Naga University, Philippines

**Abstract**

In partnership with the government and industry, State Universities and Colleges (SUCs) could help provide access to entrepreneurial opportunities. The study evaluated the Production and Enterprise Development (PED) services' current system in one of the SUCs in the Bicol Region, Philippines. It aimed to develop a framework to help improve the system. The study adopted a descriptive – evaluative research design, employing several data gathering strategies, including a documentary survey, key informants' interviews, structured survey questionnaires, and secondary data analysis. The study was anchored on the systems theory. Descriptive statistic with in-depth analysis was used. The results of the study were presented using the five categories adapted from the star model approaches for strategic organization. The study concluded that this particular state college has the necessary facilities, technology, entrepreneurial skills, and academic programs supporting the PED services. The study revealed two primary weaknesses for PED services as a functional unit. The framework proposed in this study focuses on laying up a clear strategic direction for PED. This strategic direction proposes a comprehensive view of the PED as a unit that works towards the holistic development of students' knowledge, innovative skills and entrepreneurial competencies, and commercialization.

**Keywords**

Research Utilization, Star Model, Systems Theory, Technology Commercialization

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# Design and Economic Evaluation of a Proposed Water Treatment Facility in Trinidad and Tobago

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**Vivian De La Mothe,** University of Trinidad and Tobago, Point Lisas Industrial Estate, Point Lisas, Trinidad & Tobago, W. I.

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**Nazim Mohamed,** University of Trinidad and Tobago, Point Lisas Industrial Estate, Point Lisas, Trinidad & Tobago, W. I.

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**Sharona Mohammed,** University of Trinidad and Tobago, Point Lisas Industrial Estate, Point Lisas, Trinidad & Tobago, W. I.

## Abstract

Trinidad and Tobago (TT), a small island developing state face the challenge of supplying a steady potable water supply to its population. This paper proposed a processing method for a supplemental source intended to supply a new housing development in East Trinidad. Different supply strategies such as surface water, desalination and wastewater treatment were considered and assessed using SWOT analysis and surface water treatment was chosen as the most suitable option utilizing the nearby Lopinot River as the raw water source. The flowrate of the Lopinot River was estimated to be 0.083 m3/s. and snapshot analysis of the water quality indicated that the pH was neutral (7.62), Total Dissolved Solids was 2.60x10-1 mg/l, conductivity was 253 uS/cm, turbidity was 4 NTU, an absent coliform count; values within the accepted range outlined by the World Health Organization. These parameters were utilized in the Superpro Simulation software used for the water treatment plant design. Equipment sizing, economic and consumer health and environmental safety considerations were factored into the design of the proposed water processing plant. The proposed design has the capacity to produce approximately 2,555,000 m3 on an annual basis, in excess of the amount for the Trestrail Lands development by 84%. Despite the economic indicators of Net Present Value (NPV), Internal Rate of Return (IRR) and payback time being unfavourable, the water distribution company in TT is a non-profit organization with highly subsided tariffs. It is expected that the economics would be significantly improved if the excess treated water is sold on the national distribution grid.

## Keywords

Water treatment, Plant design, Economic evaluation, water quality.

# Mars Self- Learning Habitat - Generating the Optimum Form For Future UAE's Space Exploration Missions

**Dr. Aref Maksoud,** Assistant Professor, Architectural Engineering Department, University of Sharjah

**Prof. Abbas Elmualim,** Chair, Architectural Engineering Department, University of Sharjah

**Amani Nasser,** Architectural Engineering Department, University of Sharjah

**Ghsoun Madani,** Architectural Engineering Department, University of Sharjah

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**Abstract**

Having life on Mars is a long-lasting dream that scientists have been working on for years. The UAE's future vision of the Hope Probe and many more space projects to come was the spark that ignited our ambition to take part in this vision and conduct this study. Extensive research and experiments have been conducted ever since the 1960s; this research is a summary of the findings of these experiments until this very day. The purpose of this research is to bridge various fields from architectural engineering to astrophysics, to design an ultimate habitat for astronauts and scientists on Mars in order to study the surface of Mars and the potential of habitability. Excessive research has been done on Mars' harsh environmental conditions, materials availability, and site selection. As a result, the derived knowledge led to the design of a self-learning adaptive system using automated reconfigurable robots as futuristic construction and Data analysis to solve problems concerning construction and the environmental conditions on Mars, adding to that the potential of utilizing in-situ resources in fabricating the structure of the units. This study also includes several design guidelines such as process control and optimization taking into consideration multiple elements affecting the project program such as advanced calculation technology and computational design, while using the Artificial computational intelligence support our concept that studied possible options adaptable to the environment in terms of form-finding using computation and mimicking the nature on Mars while focusing on automated approaches in construction.

**Keywords**

Material-based computation, parametric design, form finding, computational making, digital materiality, algorithmic simulation, automated reconfigurable robots, automation; Artificial intelligence

# A Technical and Economic Evaluation of On-Grid Connected Solar Photovoltaic Installation: A Case of Manolo Fortich Government Center

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**Atty. Dionel O. Albina,** Department Of Electrical Engineering, College Of Engineering And Architecture, Philippines

**Abstract**

This study aims to design and evaluate the on-grid connected solar Photovoltaic system at the roof top of new government center of Manolo Fortich, Bukidnon. The technical and economic analysis is provided for the installation of roof top solar Photovoltaic system project. The analyses of the simulation results show that the project yields energy about 97,200 kWh annual generation and about 224% return of investment for a payback period of 9.91 years. And most of all the process of electricity generation from solar photovoltaic system could save ~42 tons of carbon dioxide emission. Based on the technical and economic analysis provided in this study which shows that the project has a positive net present value then it is expected to produce more income than what could be gained by earning the discount rate, the researcher concluded that the feasibility of installing an on-grid connected PV system at the roof top of the new government center of Manolo Fortich must be materialized.



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# To see the effect of Autogenic Relaxation Therapy & Self-Management Training on Depression among adolescents: A Comparative Study

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**Abstract**

The present study has tried to explore the effect of Depression in relation to Group Therapies (Autogenic Relaxation Training and Self-Management Training) among male & female adolescents. For this, different schools in Lucknow City were contacted and the respondents were selected using Quota Sampling. A total no of 200 respondents were selected through Quota Sampling from different schools of Lucknow City, U.P they were equally divided into males and females. They were further divided randomly into equal groups having different types of group therapy. Beck Depression Inventory (BDI) constructed by Beck, et al (1961) was used to measure Depression of the adolescents. A 2×2×2 factorial mixed design was utilized to conceptualize the study and analyze the obtained data. After data collection obtained data of Pre-test & Post- test of ART & SMT were analyzed by using SPSS.20 software. The obtained data were analyzed using Means, SD, and ANOVAs. The results have suggested that SMT was found to be a better technique for reducing Depression among Adolescents. Females were found to report more depression than males.

**Keywords**

Autogenic Relaxation Therapy, Depression, Self -Management Training, Adolescents

# Influence of Steel Section Price Fluctuation to Cost Effective Design of Steel Frame Structural System In Malaysia

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**Abstract**

Steel material price fluctuation has been a problem for Malaysia steel construction industry. The price fluctuation is influence by economy policy, administrative order and macroeconomic volatility, steel industry supply and demand react to market steel price fluctuation, and the market's self-correction mechanism. With the increasing of global demand for flat steel section, the cold-formed hollow section price in Malaysia has been increasing and becoming significantly more expensive compare to I-beams. Based on the current scenario, hollow section is 19%-24% more expensive compare to I-beam. The significant price different has led to the preference of using hot-rolled beam portal frame in Malaysia. I-beam has been widely used in portal frames while hollow section is the preferred section used in truss frame. This paper objective is to find out the influence of hollow section and I-beam price fluctuation to the structural system material cost. Hot-rolled beam portal frame and truss frame weight will be compared and material cost will be calculated based on the current price of steel section. The optimize truss frame will be compared with preliminary portal frame section in ‘‘Design of Steel Portal Frame Buildings to Eurocode 3’ published by The Steel Construction Institute (SCI). The weight saving of truss frame compare to the hot-rolled beam portal frame ranging from 30%-64% depending on the building span. Structural weight saving of 30% for truss frame compare to hot-rolled beam portal frame may not necessarily give the overall saving in material price and overall steel structure cost. If the price saving of I-beam is 24% compare to hollow section, hot-rolled beam portal frame may be the best choice.



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# Minimizing Makespan in a Single Batch Machine using Genetic Algorithm

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**Abstract**

This paper deals with a single batch machine scheduling problem to minimize makespan with the consideration of sequence dependent setup time. As the problem is NP hard, a genetic algorithm is developed to provide a solution to this problem. Furthermore, dispatching heuristics such as shortest processing time (SPT), longest processing time (LPT), smallest job size (SJS) and largest job size (LJS) are developed to provide initial solutions to the genetic algorithm. All the developed algorithms and simulation are done using Spyder (Python 3.8) software. Computational results show that the genetic algorithm has outperformed the dispatching heuristics in minimizing the makespan.



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# Evaluation of the Risk of Collision between Two Target Ships Based On Observation Data from A Third Party

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**Abstract**

Detecting the risk of collision is a very important step to prevent marine accidents. For detecting the risk of collision, radar plotting is often used. Based on the relative position and motion of two ships, the risk of collision between them can be evaluated. However, the present radar equipment is not supported to detect the risk of collision between two target ships from the observation data measured by a third party. This causes difficulties for officers of shore stations, when evaluating the marine traffic situation to maintain the safety of navigation. To solve this problem, it is necessary to develop a method to evaluate the risk of collision between two target ships from the observation data measured by the shore station radar (the third party). In this article, the development of such method is introduced.

**Keywords**

risk of collision, radar plotting, marine accident

# The Study on Circuits and Cycles in Graphs Representing 3D Fabrics

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**Abstract**

This research studied properties of graphs constructed from 3D fabrics with unit structures are triangle, square and hexagon, respectively. Our main result is focused on finding the Eulerian trail, the Eulerian circuit, the Hamiltonian path and the Hamiltonian cycle on the graph obtained by simulating the 3D fabric connecting patterns. Using a vertex to represent a unit and an edge to represent the possibility of directing between two units$\in\mathbb{N}$. To provide the existence of a trail , path , circuit and cycle on graphs that vary in m, n which represent the number of rows and columns of units in a parallelogram and cylindrical form. We have also designed a cylindrical model to be used as a table lamp 3D model that applies from the Hamiltonian cycle to the wire cycle in the prototype lamp model.



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# Empirical Study on Perceived Behavior of Generation Z towards Mobile Games during Covid-19 Pandemic: A Structural Equation Modeling Approach

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**Abstract**

This study was conducted to find out the amount of time of Generation Z, which was born from 1997 to 2012 ages of 6-24 years old, who spent playing Call of Duty: Mobile (CODM) and determine the satisfaction they were with performing the mobile game since the Philippines is currently under lockdown due to pandemic. During these times, this group called Generation Z was among the population which utilizes the use of mobile technology and considering the Philippines as a third-world country, it is constantly developing and evolving when it comes to the mobile game industry.

All games that can be played on any handheld device such as smartphones, tablets, and other similar devices, are referred to as mobile games. CODM is one of the mobile games that Generation Z is familiar with. For the research context of this analysis, the researchers used Structural Equation Modelling (SEM) and applied the Self-Affirmation Theory (SAT) in figuring out the satisfaction of CODM to Generation Z. The researchers performed a survey and gathered a total of 250 valid respondents, which most of the reported participants are female. The researchers have found that the impact of self-worth to playtime has the largest patch coefficient that is shown in the result section, where factor loadings of the research model are indicated. As the researchers determined the impact of self-worth with playtime having a high impact relationship, self-worth does not significantly relate to satisfaction. The researchers also showed their data fits to the given model table (GFI = 0.86, CFI = 0.92, AGFI = 0.82, TLI = 0.92, IFI = 0.93, RMSEA = 0.068, CMIN/DF = 2.9).

**Keywords**

Self Affirmation Theory, Mobile games, covid-19, Gen Z

# Teachers' Competence towards Research Engagement: The Case of Camarines Sur, Philippines

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**Abstract**

The State Universities and Colleges (SUCs) have responded in various ways to the call for a more robust research orientation among SUCs. It is in response to the Commission on Higher Education (CHED) policies and mandates that are primarily geared towards improving research productivity. Hence, the study was conducted to investigate the teacher's research competence of selected SUCs in the Philippines. The study used a descriptive survey method of research. Data were taken from 147 teachers of different SUCs and were analyzed and interpreted using a statistical mean. The study revealed that teachers are much competent in doing research. Besides, their attitudes were optimistic despite the difficulties they have encountered in doing research works. Furthermore, it was found out that most teachers are motivated in doing researches for various reasons. Hence, the paper concluded that most teachers exceed some expectations in being a researcher and strive to conduct research despite the challenges. However, the paper recommended that further research capability programs are implemented and various avenues and opportunities for teachers to be presented to continue to engage themselves with research and further help society and the country.



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# Three Dimensions of Educational Practices: A Quality Assessment

**Dr. Apolonia C. Sebello,** Bicol State College of Applied Sciences and Technology, Philippines

**Abstract**

This study assessed the quality level of the three dimensions of educational practices viewed by thirty teachers from Jose Panganiban National High School. The study employed the descriptive survey evaluation design where thirty samples through purposive random sampling. Moreover, this study used quantitative mode as it utilized quantitative method to describe, record, analyze and interpret practices that exist. A standardized survey questionnaire called "Orientation to Excellence" was used to quantify the quality of the three dimensions of educational practices. These statements were expressed in a manner that allowed participants to assess the quality of the educational practices. The recorded and organized data were statistically treated using mean and One Sample tests and were interpreted using a 6-point likert scale. Results revealed that Jose Panganiban National High School teachers showed a high self-assessed quality level of educational practices in Student Discipline and Behavior, Instructional Staff, and Parent/Community Involvement. Further, there exists a statistically significant difference along with these three areas of educational practices. When developing a School Improvement Plan, the school should consider including all aspects of an educational dimension practice. It is highly recommended that educators start to develop a plan to improve student learning for further study.



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# Free Tuition Program: A State College Community Perspective

**Dr. Apolonia C. Sebello,** Bicol State College of Applied Sciences and Technology, Philippines

**Abstract**

The study determined the administrators, faculty, and students at Bicol State College of Applied Sciences and Technology (BISCAST) towards the implementation of free tuition. The study used a descriptive-evaluative design of mixed-method research. Observations, focus group discussion, in-depth interviews, and questionnaires were used for the data gathering among the randomly selected students, faculty, and officials of BISCAST. The study's key results indicate that implementation of free tuition contributes to the student's socio-economic status; open broad accessibility to enroll and finish tertiary education with less expense. Besides, almost all currently enrolled students claimed the positive impact of free tuition on educational needs regarding schooling, project, daily allowances, and even assurance to finish tertiary education. Parents are mentally and emotionally secure in sending children to college with fewer worries about daily educational needs; instead, the usual budget for their children's education was being used for home improvement as saved money from tuition fees. School officials proposed policy guidelines governing free tuition implementation regarding the existing guidelines on free tuition. Although free tuition law was implemented, BISCAST admission of new students shall be found on the availability of faculty, facilities, academic performance, and entrance exam result to produce quality graduates continuously.



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# State College Culture and Arts Program Implementation: A Basis for Program Enhancement and Policy Development

**Dr. Apolonia C. Sebello,** Bicol State College of Applied Sciences and Technology, Philippines

**Abstract**

Culture is vital in building a nation's progress. Culture and Arts program are implemented to sustain the identity of the nation. In this study, implementation of the Culture and Arts Program at Bicol State College of Applied Sciences Technology is described and evaluated. The study was a descriptive-evaluative type of research with 139 respondents. Survey questionnaire, document analysis and testimonials are utilized to gather the necessary data for the study. Data were presented and analyzed using frequency count and weighted mean. Analyzed data revealed that, Culture and Arts program in BISCAST is under the Student Development Services and its implementation is extensive. However, despite the extensive implementation, culture and arts administrators encountered various problems and challenges especially on its funding and support. In the outcome of the culture and arts programs, projects and activities 29% students claim that engagement on the Culture and the Arts programs, projects, and activities enhanced their skills and talents. In addition, 4% claims they have gained some extra money in their engagement in the culture and the arts. Thus, program enhancement and policy recommendation are developed and proposed to strengthen and sustain the implementation of the Culture and Arts program.



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# CACC - Computer Architecture for Combinatorics Computation

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**Abstract**

Combinatorics has been around for many years now and it has been utilized for multiple areas in mathematics such as probability and statistics. This paper aims to create a system that is able to compute certain combinatorics problems mainly focusing on: combination, permutation, and factorial problems. The system implemented is also equipped with multiple components that would aid in the computation of the output which include the main components of the MIPS architecture as well as components that are implemented for the computation of the combinatorics algorithms such as multiplication and division unit. The implemented MIPS architecture along with the datapath and control units all work together to create a system that may manipulate data and run an algorithm to provide a desirable output.



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# Machine Learning Applications in Healthcare System

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**Abstract**

Machine learning is the study of computer algorithms that improves automatically through experiences and by the usage of data machine learning algorithms build a model based on sample data known as training data in order to make predictions or decisions without explicitly programmed to do so they are used in wide variety of applications such as medicine E-mail filtering speech recognition and computer vision ,where it is difficult o run feasible to develop, conventional algorithms to perform the needs tasks. Machine learning is a growing technology which enables computers to learn automatically from past data. Machine learning uses various algorithms for constructing mathematical models and making better predictions using the existed data. In this paper we have used kaggle data set of heart disease which contains patients data with different health issues and designs and evaluates incremental learning solutions by using KNN algorithm to predict the patient who is suffering with heart disease.

**Keywords**

Machine learning, Data Analytics, Algorithms in Machine Learning, literature review, applications KNN algorithm

# A Comparative Study on the Efficiency of Solar Energy System Among Green Building in Malaysia

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**Abstract**

The increased concern regarding the environmental effects of conventional fossil fuels, mainly in connection with climate change, has driven the move to green energy and power generation from renewable and plentiful sources of energy. Solar energy systems have been widely used all over the world to provide power for building in improving energy output from renewable energy sources. The efficiency of the solar energy system is proven to reduce the energy consumption of the building. However, the efficiency of the solar energy systems integrated into the buildings depends on several factors. This paper reviews the installation of solar energy systems among green buildings in Malaysia based on analyses of available literature on solar energy in general and the efficiency of the solar energy system for energy saving. It was found that each building achieves different efficiency of solar energy systems. This paper would be beneficial towards the interested parties for building improvement and to achieve zero energy building (ZEB) via the building's integrated solar energy systems.

**Keywords**

Solar energy, energy efficiency, green building, building improvement, renewable sources

# Enhanced Artificial Bee Colony Algorithm with Mobile Sink Management to Improve Network Lifetime in WSN

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**Abstract**

Traditionally wireless sensor network uses multi-hop routing to transmit the data from source node to the sink. Many problems arise due to multi hop routing, the common problem is hotspot problem and transmission overhead. The paper has propose mobile sink based algorithm for Collection of data in wireless sensor network. Data Collection will be encouraged with efficient cluster head selection and enhanced artificial Bee Colony algorithm (EABC). Analysis of the proposed method with existing research methods has been done. Simulation results shows that proposed algorithm can effectively reduce transmission overload, and improve network lifetime, when compared with similar ant Colony algorithm and traditional LEACH methodology. Effective management of mobile sink and exploring shortest path through it proves efficient in energy Optimization of wireless sensor network.

**Keywords**

Artificial bee colony algorithm, dynamic deployment, mobile sink node



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# Convective and Conjugate Heat Transfer Enhancement over a 3-D Square Enclosure with two different heating source inputs using the DMRT-LBM Method

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**Abstract**

This research deals with a three-dimensional simulation of natural convection past a square enclosure with two different heat source inputs: constant temperature or constant heat flux. After a thorough numerical examination concerning the comparison and validation of the current code with other works in the literature, the DMRT-MRT method allows simulating the heat transfer and fluid flow suitably and with considerable accuracy comparing with the conventional methods. the main objective of this work is to investigate the evaluation of the convective heat transfer with several influencing parameters as the Rayleigh number, thermal conductivity ratio, and Prandtl number, and so on. The numerical method based on the lattice Boltzmann method associated with double multiple relaxation times (LBM-DMRT) was adopted to modeling the fluid flow mechanism and heat transfer behavior. Conjugate heat transfer was also examined in this study where the cavity base is heated regularly at either constant temperature or heat flux. The numerical results obtained were displayed in the form of the streamlines, isotherms, local, and average Nusselt number which are extensively discussed in this work.

**Keywords**

Lattice Boltzmann Method, Multiple Relaxation Times, Natural Convection, Conjugate Heat transfer, 3D simulation, Heat Transfer Enhancement

# Manufacturing Cost Of Compound Polyhedra Origami Lampshades with Equilateral Prisms { , } Unit In Platonic Hexahedron { , } Form

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**Abstract**

We investigate production cost for compound polyhedra origami lampshades with equilateral prisms {2,3} unit in Platonic hexahedron {4,3}. The manufacturing cost formula is composed of the expenses for the edges of the model, which are computed by equilateral prisms {2,3} polyhedra classification for all possible unfold patterns in equilateral prism units according to the height of each unit prism, together with the expenses for the connectors of the lamp which are varied in sizes of the cube.

**Keywords**

Compound Polyhedra, Equilateral Prism, Hexahedron, Origami

# Litho-Facies Modelling through Elastic Impedance; A Case Study of Early to Middle Jurassic, Browse Basin, North-West Shelf of Australia

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**Abstract**

Assessing the spatial distribution of petroleum reservoirs is carried out by understanding critically the internal stratigraphic architecture of sand-dominated deltas. The stratigraphic architecture of a major early–middle Jurassic is indicated as fluvio-deltaic system (Plover formation) in the Browse basin — a proven hydrocarbon province hosting gas with associated condensate on North West Shelf of Australia. Meanwhile, predicting the general distribution of facies based on geological understanding, such as sequence stratigraphy and depositional environment could be possible by generating facies model. Therefore, this research was stood out to generate physical properties that can predict lithology and detect pore fluid distribution using extended elastic inversion in the early to middle Jurassic reservoir, which is supported by angle-stack seismic data and wells. The physical properties used are muRho (Rigidity) as lithology detector and lambda-rho as fluid discriminator. The cut-off value range of muRho ($\mu\rho$) for sandstone reservoir is 36-83 GPa*(g/cc) and for shale stone under 36 GPa*(g/cc), while the range of cut-off value of lambda rho ($\lambda\ \rho$) on gas reservoirs is 0 – 38 GPa*(g/cc), indicated as low lambda rho. Based on those values, combined maps of LambdaRho ($\lambda\rho$) and MuRho ($\mu\rho$) showed the physical properties distribution on the early to middle Jurassic reservoir which is used to analyze the possibility of a facies depositional environment in the form of fluvial-deltaic reservoir towards Eastern to Western part of the research area.

**Keywords**

Litho-Facies Modelling, Elastic Impedance and Browse Basin, North-West Shelf of Australia

# A Structural Analysis of a Thai Cylindrical Hexagram Wicker

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**Abstract**

In this work, we restructure a Thai traditional cylindrical hexagram weave basket to investigate the connecting components, holes width, structure volume, along with the total length of material used in finishing figure. We also compare the accuracy of the cross-section method and the strip-group separation method with actual data in the material total length.

**Keyword**

Cylinder, Hexagram, Wicker, Weave Basket

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# Growth Performance of Rhode Island Red Chicken Fed with Nami (Dioscorea Hispida) and Wild Ubi (Dioscorea Villosa) Fermented Using Three Fungal Species

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**Dr. Marlene B. Atinyao,** Professor V, Benguet State University, La Trinidad, Benguet, Philippines

## Abstract

Nami and wild ubi, are indigenous feed resources for free range chicken. Dried nami and wild ubi were fermented using three species of fungi *Pleorotus ostreatus, Volvarealla volvacea* and *Ganoderma lucidum*. The fermented nami and wild ubi were subjected to proximate analysis and test-fed to Rhode Island Red chicken to determine acceptability, palatability and feeding trials.

The study used 36 heads of 6 weeks old non-descripted chicken for acceptability and palatability trials. The birds were randomly distributed to six treatments with two replications and three birds per replication.

For the growth trial, 240, 21 day old Rhode Island Red chicken were randomly distributed using 2 x 3 factorial. Each treatment was replicated 4 times with 10 birds per replication with the Completely Randomized Design.

Results of the analysis revealed an increases 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 appropriate fungal species to ferment nami and wild ubi. *P. ostreatus*-fermented wild ubi contained 16.62%, nami contained 18.80% compared to the 16.52%, 16.02%, 16.19% and 13.31% crude protein content when wild ubi and nami were fermeted by *V. volvacea* and *G.lucidum* respectively.

Results of the study revealed the two fermented products gave comparable level of acceptance 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 inoculant.

Experimental birds adjudged promising utilization on the acceptability of fermented products with the used of fungal cultures. *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 .

Fermented products with its 10% inclusion to commercial ration fed during the starter – grower phases significantly influence live weight, live weight gain, feed consumption and feed conversion ratio in the production of Rhode Island Red Chicken. Interaction of fermented fungi failed to manifest significant advancement in the total production of experimental birds and at the end of the two growth periods. External manifestation of impairment that may affect the physiological growth of experimental birds was not observed.

Economic performance of producing Rhode Island Red Chicken *D.villosa* fermented with *V.vulvacea,, D.hispida* with *P.ostreatus, D.villosa* with *G.lucidum* and *P.ostreatus, D.hispida* with *G.lucidum* and *V.vulvacea* were gave 73.06%, 72.68%,72.60%, 72.19%71.50% and 71.41% ROI and rank first, second, third, fourth, fifth and six respectively.

These suggest the provision of fermented products can be started at day 22 from then. Zero mortality during the two growth periods are factors that fermented products did not impair nutritive value of commercial ration.



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# Skin Lesion Segmentation and Classification on FCN based AlexNet Framework for Identification Malignant Melanoma Tumor in Human Skin

**Auxilia Osvin Nancy V,** Research Scholar, CSE, SRMIST, India

**Abstract**

Classification and Segmentation of Skin lesions are crucial in diagnosing malignant melanoma tumors. Earlier deep learning techniques are still complicated on options like boundaries identification, presence of artifacts and with restricted datasets. This study proposes the framework for detection of carcinoma by effective skin lesion segmentation and classification exploitation FCN primarily based AlexNet framework. The model consists of two stages: the first stage concentrates on an encoder -decoder fully convolutional network (FCN) to identify the lesion complex features with the encoder technique and to learn the lesion border details with the decoder. FCN architecture is framed with the sub networks interconnected via series of skip pathways. The second stage proposes a FCN-based AlexNet Framework that is designed with eight layers and also it concentrates on optimization technique to raise the efficiency of computing process. The proposed framework will be applied on ISIC2019 dataset and the expected result is above 95% of accuracy on diagnosing the skin cancer.

**Keywords**

Skin lesion, Classification, FCN, AlexNet, Melanoma, encoder-decoder

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# Finite Element Analysis of Dehusking Rollers for Coconut Dehusking Machine using the Student Version of Ansys 2020

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## Abstract

The coconut itself is a complex subject to consider in the design of dehusking rollers of a coconut dehusking machine. Across all coconut varieties, the variability of the coconut sizes, shapes, husk thickness, and force required for the dehusking, should be well studied and considered in the design. The dehusking roller is the heart and soul of the machine. The machine will fail to do its intended function if the dehusking roller will fail. The main objective of this paper is to simulate and analyze the stresses that might occur in the dehusking roller during the dehusking process.

Three types of dehusking rollers were considered in this study – the spike-type, the flat blade-type, and the triangular blade-type rollers. It was assumed that the maximum force will occur on the first strike of the spikes or blades of the rollers to the coconut husk during the dehusking process. Thus, any of the rows of the spikes and/or the blades of the dehusking roller will have the chance to experience the maximum force repeatedly when the coconuts are continuously fed into the coconut dehusking machine. So, it is important to understand what will happen to the spikes or blades, and what equivalent stress will be developed on the dehusking roller during dehusking. The maximum force required to dehusk a coconut was approximated to 600 N and used in this paper.

The CAD models of the dehusking rollers and their cut parts were developed in SOLIDWORKS 2016. The Finite Element Analysis (FEA) was done using the student version of ANSYS 2020. The only limiting factor of this analysis was the allowable number of nodes available in the student version of Ansys 2020 which is 3200 nodes. Hence, the models of dehusking rollers were cut into parts and only one part of each roller was imported to Ansys for FEA. Various meshing iterations and refinement techniques were done to maximize the available nodes that can be utilized for the FEA of dehusking rollers. Parameters such as the equivalent (von Mises) stress, total deformation, and safety factor as influenced by the maximum force applied were determined.

The FEA result, as influenced by the maximum force applied, showed that the flat blade-type roller garnered the highest rank in terms of maximum equivalent (von Mises) stress and maximum deformation of 4.94 MPa and 0.0022 mm, followed by the spike-type roller the triangular blade-type roller with maximum equivalent (von Mises) stresses and maximum deformations of 0.82 MPa & 0.0001 mm and 0.38 MPa & 0.000083 mm, respectively. In terms of the factor of safety, all roller got the same value of 15. It means that all rollers are still safe at 600 N force.

However, with this initial information, it can be concluded that the blade-type roller will most likely susceptible to failure when the maximum force applied exceeds 600 N as compared to the spike-type and the triangular blade-type dehusking rollers.

## Keywords

coconut dehusking, stress analysis, finite element analysis, simulation

# A Review of Multimodality Medical Image Fusion Techniques for Clinical Diagnosis

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**Abstract**

Multimodality medical image fusion has become a crucial area of research because of its importance in delivering a high quality output image for better clinical diagnosis and treatment. Medical imaging modalities like Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET) and Single Photon Emission Tomography (SPECT) provide only specific information that may be suitable for detection and analysis of specific diseases. In order to get all those information together into a single image to make clinical analysis and treatment much easier for the doctors, multimodality medical image fusion is adopted. This paper gives a review of various multimodality medical image fusion algorithms over recent years in chronological order. A comparative study of different image fusion techniques with their pros and cons is given. This paper also explains different methods that are been used by researchers for multimodality medical image fusion.



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# Earthquake-Induced Coastal Inundation Map of Bohol Province using Enhanced Bathtub Model (eBTM)

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## Abstract

Numerous studies about sea-level rise and coastal inundation were accomplished in other countries such as Bangladesh, China, and India. However, in the Philippines, only limited studies about coastal inundation exist particularly for the geologically active province of Bohol. The principal concept of sea-level rise resulted into increasing threats following the October 2013 7.2 magnitude earthquake of Bohol where the North Bohol Fault or Inabanga Fault was said to be associated with the reverse fault causing ground rupture and remarkable uplift. The specific event also resulted into coseismic subsidence from the northeastern part of the epicenter (9.86 °N, 124.07°E; Depth: 12km). This research tried to answer the following question: What specific areas and populations in Bohol province are affected and at high risk of Coastal inundation, specifically of parameters ranging from 1 m to 15 m due to coseismic subsidence. In order to create a modified analysis representation of the map, it will be divided into four different outcomes highlighting each parameter. The four total divisions in our flood risk and NPAAAD map both include: (1) 0–1-meter, (2) 1-5 meters, (3) 5-10 meters, and (4) 10-15meters. The modified flood risk map was assessed by using Enhance Bathtub model (eBTM). In the generation of the flood risk map, a cross-correlation between using a data map from the Network of Protected Areas for Agricultural and Agro-industrial development (NPAAD) was suggested to identify the affected land use areas economically and analyze the extent of the hazard.

## Keywords

Coastal Inundation, Earthquake, Sea-level rise, Coseismic subsidence, Network of Protected Areas for Agricultural and Agro-industrial development, Flood risk, Below Sea Level, Mean Sea Level

# 3D Numerical Simulation of Ultrasound Waves and Acoustic Streaming using Lattice Boltzmann Method

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**Abstract**

Considering their important applications in medicine, industry and also in everyday life, ultrasound waves are selected as a research topic in this paper. Indeed, the three-dimensional (3D) lattice Boltzmann method is suggested to investigate the propagation of acoustic waves in 3D. The main objective of this study can be summarized in two parts. The first step deals with the ultrasound waves generated by a square acoustic source located at the center of the left wall of a 3D enclosure filled with water. The second part focuses on the flow induced by the propagation of the waves in the cavity: it concerns the acoustic streaming. The digital code employed is validated by examining the typical problem of flows generated by a lid driven cavity. In order to have reliable results, the two-dimensional LBM method is also introduced in this work to compare the results found in 2D and 3D.

**Keywords**

Lattice Boltzmann method, Ultrasound waves, Acoustic streaming, 3D simulation

# Work From Home Perception and Emotional Intelligence Domains in the Challenge of COVID-19 Pandemic

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**Raja Zirwatul Aida Raja Ibrahim,** Universiti Malaysia Terengganu

**Abstract**

This study focuses on the work from home perception, and emotional intelligence domains among civil servants in the challenge COVID-19 pandemic scenario. The specific purpose of this study was to test the perception of work from home influence on the emotional intelligence domains of civil servants in a statutory body in Malaysia. A total of 2268 respondents were selected for the category of academic and non-academic staff. The first measurement tool used was a questionnaire developed by the researcher, and it went through a process of instrument and construct validation, namely the Work From Home Perception Questionnaire of COVID-19 Challenge (WFHPQue-CvdC). While the second questionnaire is Domain Emotional Intelligence Questionnaire of COVID-19 Challenge (DEIQue-CvdC). In this study, regression analysis was used to determine the effect between perception of work from home on the emotional intelligence domains. The findings of the study showed that there was a significant effect in all the variables studied.

**Keywords**

Working, Perception, Emotional Intelligence, Challenge, Pandemic

# Fear and Fate: The Life Story of Jeepney Drivers dealing with Pandemic

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**Abstract**

A public transportation driver in the Philippines namely Jeepney drivers are among those who are greatly affected by COVID-19 pandemic. Along with lockdown implementation, it became difficult for Jeepney drivers to get passengers. Moreover, when the transport was halted and people started staying inside their houses, it became hard for them to earn enough money to feed and support their families. Thus, affecting them financially, mentally, emotionally and other aspects. This study aims to determine the challenges that the Jeepney drivers had encountered during the pandemic, how they cope with those challenges and what government services are offered to Jeepney drivers. Furthermore, the researchers utilized descriptive qualitative research which methods are used to answer questions about their experiences, meaning and perspectives of Jeepney drivers. After gathering data, the researchers used thematization to analyze the data, it revealed that Jeepney drivers suffered a lot during the pandemic, concerning their income and well-being. Some Jeepney drivers struggled to live and make a living in this pandemic. Although, most of them found alternative jobs and said that they would not give up for the sake of their families. It is also shown that there are many different aids given by specific government agencies and these aids or assistance serves as a help to the unfortunate Jeepney drivers.

**Keywords**

Jeepney drivers; Income; Covid-19; Experiences

# Autoencoder using Latent Space Representation for Automatic Generation of Molecules

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**Abstract**

From the moment of identifying the fundamental cause of an illness to its availability in the marketplace, it takes an average of 10 years and $2.6 billion dollars to develop a medication. We're actually hunting for a needle in a haystack, which takes a lot of time, effort, and money. In a solution space of between 1030 and 10100 synthetically viable compounds, we're seeking for the one molecule that can turn off a disease at the molecular level. The chemical solution space is just too large to adequately screen for the desired molecule. Only a small percentage of the synthetically viable compounds for wet lab research are stored in pharmaceutical chemical repositories. Computational de novo drug design can be used to explore this vast chemical space and develop previously undesigned compounds. Computational drug design can cut the amount of time spent in the discovery phase in half, resulting in a shorter time to market and lower drug prices. Deep learning and artificial intelligence (AI) have opened up new perspectives in cheminformatics, especially in molecules generative models. Recurrent neural networks (RNNs) trained with molecules in the SMILES text format, in particular, are very good at exploring the chemical space. Two baseline models were created for generating molecules one of the models includes an encoder that takes SMILES as input and then develops a deep generative LSTM model which acts as a hidden layer and the output from layers acts as an input to the decoder. The other baseline model acts the same as the above-mentioned model but it includes latent space, it is simply a representation of compressed data that bring related data points closer together physically. To learn data properties and find simpler data representations for analysis, and weights which are obtained from the previous model to generate more efficient molecules. Then created a custom function to play with the temperature of the softmax activation function which creates a threshold value for the valid molecules to generate.This model enables us to produce new molecules through successful exploration.



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# Addressing the Constraints of the Elderly Tourist in A Recommendation Algorithm

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**Abstract**

At a time when the aging society is growing dramatically, tourism could be one of the key factors to increase the quality of life for the elderly. Generally, tourism information recommendation algorithms suggest attractions that are applicable to the demands and needs of tourists which do not necessarily satisfy the preferences of elderly potential tourists, or acknowledge their physical constraints. In this article, research on elder tourism algorithm that recommend best fit attractions for individual elders with various limitations, is presented and discussed. The algorithm of interest uses three different factors relevant to the elderly tourist and their probable physical limitations. The algorithm being considered categorizes elderly tourists as being entirely self-reliant, partially self-reliant, or are wheelchair reliant, as the important factors to consider when developing a tourism information recommending algorithm. The requirements of elderly tourists in each of these categories will obviously vary, so each of these conditions have been acknowledged and applied in the development of the algorithm. This paper applies descriptive statistics appropriate to each elder category and the constraints, to describe the level of significance of each factor. Empirical studies have demonstrated how significant factors enhance the accuracy of the recommendations in terms of appropriateness related to elderly tourist's constraints.

**Keywords**

Aging Society, Elder Tourism Algorithm, Elderly Tourist's Constraint, Recommender System

# An Analytical Close Shaft Study on Various Credit Card Fraud Detection using Data Mining Approaches and Algorithms to Remove the Prevailing Bottlenecks

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**Abstract**

Credit card fraudulent activities cause many financial losses for the consumer and the organization. For the past few decades, many studies have been performed using data mining and Machine Learning (ML) techniques. There are two types of transactions such as normal transaction and abnormal transaction. If the transaction is abnormal means, there are different
data mining techniques that are used to predict abnormal transactions. Such as Decision tree, Agglomerative clustering algorithm, Random tree, Logistic regression, Optimal anomaly detection techniques. In this study, the Random forest technique is used and analyzed to reduce
the credit card fraudulence. This mechanism gives an accurate percentage for detecting fraudulent data. In this review, several datasets are used to compare the data mining techniques
which give the best accuracy rate. Such datasets are taken from the European Central Bank, Company in China. Precisely this approach will give many benefits for the customers and the organizations who are involved in online shopping and online transactions.

**Keywords**

Random Forest, Decision tree, Logistic Regression, Machine Learning (ML)techniques, Data Mining techniques

# Analytical Solution of Some Nonlinear Equations Arising in Heat Transfer

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**Abstract**

Heat transfer is a very important process in many engineering and scientific applications. It is mostly governed by linear or nonlinear differential equations. It can be challenging sometimes to solve the governing equations especially if they are nonlinear. In this paper modified variational iteration method is used to obtain analytic solution of some nonlinear equations arising in heat transfer. This method is developed by change in the formulation of variational iteration method. The solution is considered as an infinite series converging towards the exact solution rapidly. All computation work has been performed in MATHEMATICA.



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# Additional / Emergency Power Supply for Small-Load Marine Vehicles

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**Pratyush Verma,** Mechanical Engineering, Galgotias University, Greater Noida, India

**Rahul S. Pokhariya,** Mechanical Engineering, Galgotias University, Greater Noida, India

**Abstract**

Aryan Singh is a mechanical engineering student in Galgotias University, India. His knowledge and effective field centres in 3D prototyping and designing, which makes his work quite equitable. His research currently focuses on providing a probable solution to a hidden aspect of marine transportation industry.

Pratyush Verma is also a mechanical engineering student in Galgotias University, India. His knowledge and effective field centers in harmony and synchronization. His idea for this research is to blend the motive with a rigid prospect.

Rahul S. Pokhariya is also a mechanical engineering student in Galgotias University, India. His area of expertise centers in assembly. His motive with this research is develop and bring the idea of this research to existence.



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# Quality Assessment and Heavy Metals Analysis in Potable Water at Nagaur Region of Rajasthan (India)

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## Abstract

Metal contamination in water is a major determinant of water quality. People who consume this water suffer from water borne diseases. There are various natural and anthropological activities at the sample collection site leading to increase in concentration of trace elements in drinking water. The objective of this study was to detect metal concentration in surface and ground potable water from selected residential areas in the Nagaur district.

Nagaur district has been known for using heavy amount of pesticides in agricultural practices. As the inorganic pesticides contain elements such as arsenic, cadmium, iron, aluminum, sulfates, lead, mercury and copper, they do not degrade readily and remain in the soil and water system for long time. Traces of these are also likely to leach to groundwater sources, which is depleting for various reasons including the climate change impacts. This study attempted to assess the extent of use of pesticides and its implication in the depleting ground water source. The method employed to assess the extent of use of pesticides included desk study, field survey and key informants, whereas water samples from the wells and ponds were analyzed in the laboratory to assess Lead, Copper and Mercury content in water. There is a growing awareness about the adverse effects of pesticides and yet all households interviewed in the study were found to be using pesticides. Nonetheless, a majority of the respondent believe that the use of pesticides has been progressively reduced. Lead was found to be in considerable amount, but the Mercury concentration in the well-water was found to be very high from 0.007 to 0.035 in twelve wells and hand pumps studied in the Nagaur region. Though there is no indication of mercury based pesticides being used, high concentration of mercury in the well-water deserves a thorough examination of possible sources form where it is coming to water.

Samples were analyzed using atomic absorption spectrometry to determine the concentration of dissolved metal. Metal analysis was done to detect chromium, copper, zinc, lead, cadmium, magnesium and calcium. The results obtained were compared with guidelines for drinking water quality such as the World Health Organization (WHO) guidelines.

## Keywords

Contamination, Ground water, Heavy metals, Atomic adsorption spectroscopy

# Improving B2B2C Strategies through Digital Technologies and Platform for Cross-Border E-Commerce between Thailand and China

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**Abstract**

Cross-border e-commerce transactions between the China and Thailand have grown rapidly based on China's "Belt and Road" policy and the background of Thai Industry 4.0. Culture, consumption habits, language differences and cumbersome cross-border trade procedures between the two countries are the main reasons that hinder the development of the regional economy. The new business environment requires new strategies. To solve the problem in Business to Business to Consumers (B2B2C), this article comprehensively analyzes the advantages and geopolitical advantages of China's Guangxi and Sichuan Free Trade Pilot Zones under the ASEAN framework. Based on the WeChat platform, the computer programming language, location-based services technology, management information system, Thinkphp (Backstage) and Tencent Cloud Pagoda Panel are comprehensively applied to WeChat developer tools, and combined with the characteristics of Thai products, to create a rich content, scan the WeChat applet. The applet will serve Thai merchants by helping them overcome language, cross-border transfers, and post-sales services. Through the B2B2C business model, the current direct mail business model based on data packets can only sell define quantity products. At the same time, it will better serve consumers and enable consumers to buy high-quality and inexpensive Thai products.

**Keywords**

Cross-border e-commerce, B2B2C, Pilot Free Trade Zone, Set Theory, WeChat Mini

# Intelligent Distributed Method to Secure Stored Data in Cloud Computing

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**Abstract**

Computing using cloud services is a new and different paradigm that is manufacturing nice changes to enterprise hardware and code style additionally opening a massive path to the web based computing services for meeting the varied wants because the cloud is gaining huge advancement cloud knowledge security and privacy of information is turning into an essential issue. If we have a tendency to take into account all the safety problems associated with the cloud then one amongst the main issues is that cloud operators have an opportunity to succeed in the cloud user's sensitive knowledge. This concern dramatically decreases the usability of cloud computing in several areas, like monetary organizations. This paper concentrates on the difficulty that cloud operators cannot reach the sensitive info of cloud users and thus proposes a new cryptography method by which cloud administrators cannot gain access to the entire information. The proposed approach divides the data into three parts and thus the data is stored in three different distributed clouds due to which cloud operators cannot reach the complete data, they can only gain access to the partial data which is of no use. In this paper we will propose a solution to the above- stated problem and will try to develop a model which focuses on secure cloud data models with acceptable computation time.

**Keywords**

Security aware, cryptography, big data, cloud computing, data encryption, mass distributed storage

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# Conceptual Framework and Methodology for Reducing Lane Defilements with High Accidental Ratios in India Roadways using GSM & Zigbee Transmitters as IoT Edifice

**Dr. Swetha Margaret T A,** Assistant Professor, Department of Computer Science, Stella Maris College, Chennai, India

**Abstract**

Over Speeding is one of the major reasons for accidents and crime in highways. Though a speed limit of 60-100 km per hour is set within the highway parameters, no driver takes ownership to maintain the speed limit in crucial and prime areas such as city junctions and National Highways. The objective to take up and work on this sector is to design a useful and implementable system for saving many precious lives from accidents and deaths. There are many systems available to control the speed of a vehicle. But due to its implementation cost and inefficiency of the model, it was not helpful in reducing the rate in occurrence of accidents in highways. Hence a new technological solution with an improved reach is needed, in order to achieve a couple of important need of the hour. First, to maintain the speed of a vehicle within the limit of the speed for a prescribed lane. Second, to attain controlled lane driving in Highways. This is important because by preventing the vehicle from switching in between lanes in highways will result in concentrated and leveled driving by driver .The proposed system has a vigilant, recording and broadcasting system to stumble on and control the vehicles which are crossing the speed limit in restricted areas and national highways in India. The ZigBee receiver unit is placed in the vehicle which receives messages about the speed limit from the ZigBee transmitter and sends it to the microcontroller, which decides whether to have control over the speed of the vehicle or not .The ZigBee technology is preferred for this application because of its low cost deployment and redeployment along with mesh networking which is an open standard with multiple vendors and battery operation. Sensors like IR and Accelerometer is used for determining the speed of the vehicle. GSM (Global System for Mobile Communication) is used for sending broadcast messages to alert the driver about violating the speed limit. A fine will be generated and the vehicle will be jammed from working, until the amount is paid by the user. The penalty can be paid by the user by accessing his account through mobile app.

**Keywords**

ZigBee, GSM, Sensors, IoT, Controlled lane driving, Over speed management, transmitter and receiver system

# A Study of Integrated Inventory Witnessing Investment in Preservation Technology for Deteriorating Items and Optimal Cycle Time

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**Chandrakant Patel,** Amrut School, Ahmedabad, Gujarat, India

**Abstract**

This peace of art formulates an integrated inventory model to curtail joint total cost of manufacturer and retailer. It is accustomed that, display of stocks play an intimidating role to increase the sales as it may attract the customer to buy more. Thus contemplating the proposed model to undergo demand rate as stock dependent. The notion of two echelon trade credit is implemented as offering permissible delay for settlement of account is a promotional tool to hoick the sales. The ideology of preservation technology is employed to monitor deterioration. The motive is to condense the joint total cost apropos cycle time under preservation technology investment. To validate the model sensitivity analysis for the inventory parameters is performed and numerical illustrations are conferred. The results of this work facilitates the inventory management of fast moving consumer goods.

**Keywords**

Deterioration, Integrated model, Permissible Delay, Preservation Technology Investment, Stock dependent demand

# Covid-19 Prediction Using Exploratory Data Analysis Technique in Python

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**Abstract**

The sum of COVID-19 cases in India is increasing at a speedy pace. The National and native authorities have a tough time making a pattern, analyze and forecast the unfold of COVID-19 in India. This paper aims to draw an applied math model for a higher understanding of COVID-19 growth in India by totally learning the reported cases within the country until 22 April 2020. Associate preliminary information Analysis (EDA) technique is being enforced to check and analyze the reported COVID-19 cases in India used by Python programming. The analysis results break the impact of COVID-19 in India on a daily and weekly manner, compare India with adjoining countries also like the countries UN agency are badly affected and arrangement of India's attention sector for such epidemic.

**Keywords**

COVID-19, exploratory data analysis technique, India's analysis, abutting countries analysis, healthcare sector analysis

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# Crime Prevention and Prediction Using Machine Learning Approach in the Case of Hossana Police Commission

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**Biniyam Yirsaw,** Wachemo University, School of Computing & Informatics, Department of Information Technology, Hossana Ethiopia

## Abstract

**Background:** Crime is a socioeconomic problem that affects the life quality and economic growth of a country. And it increases time to time. Crime prevention is an attempt to reduce the occurrence of crime and detect the crimes and criminals. Crime prevention and prediction is a systematic approach for identifying and analyzing crime data to get a useful patterns and trends in crime. The aim of this study is to predict crime occurred areas which may have a higher probability for crime occurrence (urban or rural). Crime analysis is a technique that used to predict future crime locations by using past crime data. Predictive policing is used by the law enforcement organizations for taking proactive actions against crimes and make decisions. This will help the police departments to efficiently focus their resources on the potential crime areas.

**Method:** For this experimental research, we use a supervised learning method specifically classification technique. There is a labeled final class that indicates whether the crime is occurring in urban or rural area. So to do this, the Python programming language with Jupyter notebook and decision tree algorithm is used.

**Result:** We divide the data as *training a*nd testing set and the model is *trained* by *train* data. After we train it the model is to predict the crime area either it occurred in urban or rural area. Using *a decision tree algorithm* the model scored an accuracy of 91% in 80% training and 20% testing sets.

**Conclusion:** We conclude that crime prediction is a good trend to predict the occurrence of the crime area either in urban or rural area by analyzing the previous data using machine learning approach. And it is a promising result scored in using the decision tree algorithm in python programming language..

## Keywords

Crime, criminal, machine learning, prediction, prevention

# Development of Load Moment Control and Monitoring System for Mobile Heavy Load Cranes

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**Abstract**

This study was conducted to develop a fully functional controlling and monitoring device to be used during the actual industrial operation of mobile heavy load cranes. The project aimed to provide a cost effective and user-friendly load moment indicator that meets the requirements of industry safety standards. The control system of the device measures and monitors the main parameters such as boom length, working radius, tip height, maximum load capacity based on crane load chart, actual load, efficiency and (actual load/maximum load) ratio. It was developed using the advanced application of Programmable Logic Controller (PLC) and latest technology of Human Machine Interface (HMI). The interface of Delta PLC and Delta HMI was able to replace the traditional controlling panels which need extensive wiring and the monitoring screen allows the user to complete settings through touchable keys on a user-friendly window. The performance of the implemented load moment control and monitoring system was evaluated and compared to the standard manufacturer rated lifting load chart. A series of tests was conducted and the results attest that the developed device successfully attained its functionality with an average of 99% accuracy on all the readings.



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# Analysis of Future Probabilistic placement of Electric Vehicle Chargers on 11kV Real Residential Feeder

**Farah-ul-Ain,** Research Student at U.S.-Pakistan Center for Advanced Studies in Energy (USP-CASE), National University of Sciences and Technology (NUST)

**Abstract**

Electrification of transportation sector and provision of effective and well-designed charging infrastructure to vehicle owners is an important task. The following document depicts the modelling of an 11kV Gulshan-e-Iqbal residential feeder from the data provided by Lahore Electric Supply Company (LESCO) of Pakistan. Feeder modelled provides power to Gulshan Iqbal Block of Allama Iqbal Town in Lahore. Analysis of voltage profiles, line loading percentages and secondary transformer loading has been performed after 14.1% penetration of level 1 and level 2 EV chargers. Nodes having weak hosting capacity have been highlighted. The violations of critical parameters caused by increased grid load due to installation of possible EV load has been addressed with feasible solutions. The data provided was in Synergi, a licensed software, which redirected our research to use of PandaPower in Jupyter Notebook which is an open-source software. The use of OpenDSS and PyCharm were also part of our research work while extracting the exact data to perform following studies. Our studies can help to improvise the planning in placement of EV load in the grid and highlight the problematic nodes which needs reinforcement.



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# Fingerprint Biometric Attendance Monitoring with Leave Management System for the Employees of Callang National High School, San Manuel, Isabela

**Ronald Bautista Rivera,** Isabela State University – Angadanan Campus, Angadanan, Isabela

**Abstract**

In this study, an enhanced attendance monitoring system using biometric fingerprint recognition in tracking and monitoring employees' attendances for Callang National High School, District 04, San Manuel, Isabela was introduced. For most organizations, handling people is a daunting job in which it is very important to maintain an accurate record of attendance. Taking and maintaining the attendance of employee manually on a regular basis is a big activity that requires time. For this reason, an effective system was designed. The system was designed and developed primarily to improve the monitoring of employees' attendances and leave management through the use of biometric technology. It records the data of the employees, handles leave management, tracks employee attendance and encourages participation through fingerprint recognition. The system is equipped with a dashboard monitoring system that can be viewed by school heads to track the list of employees, early birds (employees who arrived early), on-leave staff, on-official business and a statistical graph of the monthly attendance rate of employees. Moreover, the system provides an auto-generated DTR for employees which saved time compared to the manual process. The innovation greatly affects the improvement of employees' attendance through its automated attendance monitoring, leave management and report generated by the system. The impact of system to the employees was identified through first quarter attendance report of SY 2028-2019 which served as a bases of comparison with the attendance rate of SY 2019-2020 when the system was implemented. The outcome shows that through the usage of the system, employees' attendance has improved.

**Keywords**

fingerprint, attendance, leave management.

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# Growth of the City – Chennai (Based on Urban Ecology)

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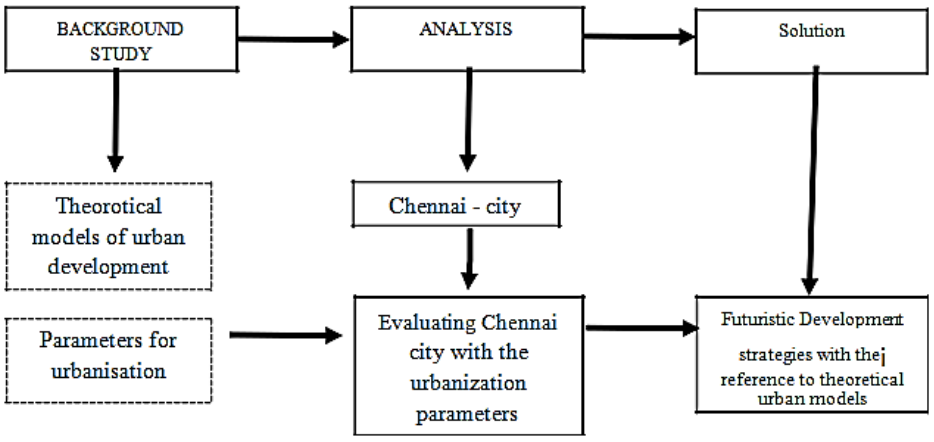
**Abstract**

"A city should be built to give its inhabitants security and happiness." – Aristotle (Greek philosopher & scientist) . The English word "city" - from the Latin cīvitās, a highly organized community; city-state , (Wikipedia 2014),(UN-Habitat 2014) . The city planning is to elevate the 'quality of life' by making it 'widely inclusive' (spatially as well as socially) with the sustaining knowledge about the critical systems of the city . Chennai city one of the four metropolis of India , bounded by the coromandel coast on the east is the biggest commercial , cultural, economic & educational centre in South India is also the capital of the state of Tamil Nadu. The birth of the City , dates back to 1639 on the establishment of the British east India company in Chennai. The City is experiencing rapid urbanization in the recent times due to the uncontrolled growth of expansion which in turn is affecting the urban ecology. Urban ecology is a multidisciplinary approach to improving living conditions for the human population in cities, referring to the ecological functions." This paper explores about the "Growth of the City – Chennai (on terms of Urban ecology) , studies about the theoretical models of Urban development as the background study along with the parameters of urbanization , and compares it with Chennai city on the same , analysing the issues and proposes futuristic development strategies for the analysed issues.



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# Optimization of Biosurfactant Production from Bacteria Strain Isolated from an Egyptian Oil Field

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**Pedro Diaz,** Division of Chemical and Energy Engineering, School of Engineering, London South Bank University, London, UK

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## Abstract

Microorganisms have the potential to exploit residual hydrocarbons in depleted reservoirs in a technique known as microbial enhanced oil recovery, MEOR. This study highlights the importance and potential of microbiology in petroleum engineering. This work investigates the production of biosurfactants from isolated bacteria strain obtained from a crude oil sample collected from an Egyptian oil field located in Western Desert. Bacillus spp, a bacilli species that could produce biosurfactant, was identified based on its morphological and biochemical characterization. In order to optimize the surface activity of the produced biosurfactant, ten different reported nutrient media, and a new proposed nutrient medium H were examined. *Bacillus spp* has shown the ability to produce a very active biosurfactant that reduced the surface tension of water from 71.81 mN/m to 25.74 mN/m, and the interfacial tension of water against kerosene from 48.43 to 0.38 mN/m at Critical Micelle Concentration CMC of 0.038 g/l, in a medium supplemented by the new proposed nutrient medium H. The growth rate of Bacillus spp was reached its maximum (2.072 x $10^9$ CFU/ml) after 24 hours of incubation. Biosurfactant production has no significant change in its surface activity over a wide range of temperature range up to 120$^o$C, which means the studied species *Bacillus spp* is a thermophilic bacterium. *Bacillus spp* grew well in the presence of high salt concentration up to 20% NaCl, the optimal surface activity was obtained in range of 0-2% NaCl, and at pH 7 (neutral values). The emulsification activity of the produced biosurfactant reached the maximum (69.52%) at temperature 30$^o$C, Salinity 0% NaCl (distilled water), and pH 7. The produced biosurfactant yield was found to be 2.853 g/l. The FT-IR spectra analysis of the purified biosurfactant confirmed that the produced biosurfactant was surfactin, which is a very powerful surfactant. Finally, it could be concluded that *Bacillus spp could* grow and produce effective and efficient surfactin that retain more than 60% of its surface activity under harsh conditions that are relevant to Microbial Enhanced Oil Recovery, MEOR.

## Keywords

Bacillus spp; indigenous bacteria; biosurfactant; microbial enhanced oil recovery; surface activity; emulsification activity

# Innovative Approach to Resolving Ambiguity Using Deep Learning

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**Dr. Nikhat Raza,** Associate Professor Department of Computer Science and Engineering, MPU Bhopal, Madhya Pradesh, India.

**Abstract**

Language is the center of Information trade, where world has around 5000 tongues in the spoken and composed structure, additionally accessible is boundless recorded data composed and put away in these tongues. It's a current day need in this Information innovation period to make accessible this data to the whole world in their reasonable structure for example in their regular language. By and by machine interpretation is endeavored by numerous analysts for coordinated language interpretation or for more than one language pair and with this to make an interpretation of from any to any language requires immense equal projects and corpus and significant issue of tremendous preparing and testing period with different intricacies like tongues in concern show an alternate design, not every one of the words in a single language have identical words in different tongues, various manners by which sentences are assembled, words with various implications which results into vagueness and so forth This paper proposes an open edge work for lingual machine interpretation with unclearness objective.

**Keywords**

Neutral language, ambiguity, lingual, machine translation

# Ultra-High-Performance Concrete Developed Using Mineral Admixtures and Steel Fibers

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**Abstract**

UHPFRC, ultra-high-performance fiber-reinforced concrete materials exhibits several advanced properties over conventional concrete. This paper aims to develop such ultra high-performance fiber-reinforced concrete having high strength and durability. Casting involved keeping the cement content minimum, mineral admixture silica & nano silica constant, and varying the ratio of ground granulated blast furnace slag (GGBS) & steel fibers. Manufacturing of cubes was done under laboratory condition and were kept for 7 and 28 days of curing. Compressive strength was determined using ASTM (500 tones). Investigations from the present work showed that strength increased in proportion of the fibers in mixture. The maximum strength achieved after 28 days of curing under laboratory conditions was 158 MPa for mixture of 8% silica fume, 2% nano silica, 10% GGBS, 1.5% steel fibers with remaining 80% as cement content. The present study will further provide input towards other researchers in UHPFRC formulation.

**Keywords**

UHPC, UHPFRC, mineral admixture, steel fibers, compressive strength

# A Real Data-Driven Clustering Approach For Countries based on Happiness Score

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**Chris P. Tsokos,** Graduate Teaching Assistant, Ph.D Candidate, Mathematics & Statistics, University of south Florida

**Abstract**

In machine learning and data science literature, Clustering is the task of dividing the obser- vations (data points) into several categories in such a way that data points falling into one group are being dissimilar than the data points falling to the other groups such that the variation within a group is minimized and the variation between the groups is maximized. It falls under the class of unsupervised learning techniques. It is primarily a tool to classify individuals on the basis of similarity and dissimilarity between them.

Our present study utilizes the world happiness data of 156 countries collected by the Gallup World Poll. Our study proposes the most accurate (if not the best) clustering algorithm with a very high degree of accuracy to classify different countries of the world based on several economic and social indicators. The most appropriate clustering algorithm has been selected based on different statistical methods. We also proceed to rank the top ten countries in each of three clusters ac- cording to their happiness score. The three leading countries in terms of happiness from cluster 1, cluster 2, and cluster 3 are Oman, Denmark, and Guyana, respectively, followed by Finland, United Arab Emirates, and Pakistan. Finally, we use four popular machine learning classifica- tion algorithms to validate our cluster-based result and obtained very consistent results with high accuracy.

**Keywords**

Clustering Algorithms, Subjective Well Being (SWB), Stability Measures, Ma- chine Learning Classification Algorithms

# Mechanical Property Testing on Critical Length of Fiber on Natural Areca Sheath Reinforced Polymer Matrix Composites by Tensile and Flexural Testing's

**Parvatini Sri Naga Venkat,** Research Scholar, Assistant Professor, Department of Mechanical Engineering, Koneru Lakshmaiah Education Foundation, Andhra Pradesh, India

**Abstract**

In the present work, the naturally extracted Areca fibers are used as a reinforcement and Epoxy L-12 is used as polymer matrix and prepared by using Hand lay-up method. Each specimen is cured for 24 hours and then test specimens were cut according to ASTM standards for Tensile and Flexural Testing. In present work, Physical property of Natural Areca fiber is carried by using "Interference at Air Wedge method" and Fiber Density was calculated. The critical Length of Areca fiber will be analyzed by conducting Tensile and Flexural testing for three different fiber size specimens prepared with a band width of 2mm starting from 29 to 25mm. Finally, the obtained results will be evaluated with Analytical F.E.A Method. These Natural Areca fiber reinforced polymer matrix composites can be used in low-Strength structural and Non- Structural Applications.

**Keywords**

Areca fibers, Tensile Test, Flexural Test, Critical length, Interference at air wedge,, Finite Element Analysis(F.E.A), Natural Fiber Composites(NFC)

# Numerical Modelling of Coir-Geocell Alignment Methods on the Stability of the Geocell-Reinforced Slope

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**S.M.Nawghare,** Assistant Professor, Department of Civil Engineering, College of Engineering, Pune, India

**Abstract**

This study deals with the use of coir geocell to deal with the surficial stability of slope, based on numerical analysis using Geostudio 2021 software.This paper aims at understanding two different methods to improve surface stability using coir geocells as reinforcement. Method 1) Laying the coir geocells as primary reinforcement and method. 2) Covering the slop e facing by coir geocell layer. The slope being located in Rampur, Dist-Ratnagiri, insitu tests were not possible, so disturbed soil samples were collected from the site for determination of strength parameters, which were further used as inputs for the software analysis. The plain strain condition was considered for analysing three slope heights 7m, 10m and 20 m and three slope angles of 30, 45 and 60, using the LE Morgenstern-Price method. Considering both the methods, the FOS was found to be greater in the Method 1 case than the Method 2. Further, it is observed that neither of the methods seem to be suitable on the basis of FOS for surficial stability for steep slope at 60.

**Keywords**

Coir Geocells, Morgenstern-price method, surficial stability

# Handwritten Digit Recognition using CNN

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**Abstract**

Handwritten digit recognition allows the computer to recognize the digits written by humans. In general, it is a hard task for the computers to recognize the digits because the handwriting varies with the person and there is no standard handwriting. In some languages the letters overlap making the computer hard to recognize the characters. So, Using Handwritten digit recognition technique we train the machine with different handwritten digits making the computer task easy. In this project a Convolutional Neural Network model was built. Inorder to train the model MNIST dataset is used as it consists of 60,000 training datasets. A graphical user interface is created which captures the image placed in front of the camera and passes the image as the input to the model so that the model predicts the output and the output is displayed in the result section of the graphical user interface.

**Keywords**

MNIST, CNN, OpenCV, TensorFlow

# Steel Frame Structure Defect Detection Using Image Processing and Artificial Intelligence

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**Abstract**

Steel Frame Structure Defect Detection is one of the main stages in constructing a building, where most of the times it has been done manually, which leads to no proper inspection, on top of that there isn't any technical device to monitor it, especially in Sri Lanka.

The aim of this paper is to detect six main defects in welded steel frame structure by using image processing and deep learning algorithms, where the application would aid individuals in construction site to identify defects in said steel frame structures at an early stage of building in order to avoid casualties caused by the defect. An android application incorporated with a classification model was proposed and built. In this research, MobileNet has been used as the classifier algorithm, where Transfer Learning has been implemented on the pretrained model on ImageNet. CNN layers have been customized where GlobalAveragePooling2D layer has been implemented with Rectified Linear Unit being the activation layer and being fed into SoftMax layer. Furthermore, SGD optimizer with Categorical Cross Entropy Loss functionality have been applied. An image preprocessing of data augmentation and image transformation have been done. Viewpoint range is achieved at 10 – 3cm and error free under device rotation circumstances. Robustness and processing performance of the application have been achieved to an optimum level since it runs locally. The mean accuracy level of device has been achieved for 91% for scratch, 78% for patches, 81% pitted surface, 78% for crazing, 73% for rolled in scale and 67% for inclusion defects in welded steel frame structure which sums up with a model mean accuracy being at 78%.

**Keywords**

Welded Steel Frame Structure, MobileNet, Transfer Learning, Defect Detection, Data Augmentation, Image Transformation

# Effectiveness of QIIME Tool for Detection of Genetic Variation among Freshwater Microbiome Population

**Sayali S. Jamodkar,** Department of Bioinformatics, SantGadge Baba Amravati University, Amravati, MS, India

**Abstract**

The present investigation entitled "Comparative metagenomicanalysis of freshwater microbiome using Bioinformatics Quantitative Insights into Microbial Ecology (QIIME) Pipeline tools" was carried out with the objective to assess genetic variations of microbial population in contaminating water of River Ganga. This study was conducted during the year 2019-20 using next generation sequencing (NGS) plat forms of Bioinformatics tools. The material consists of raw sequences which were already available through SRA database was used in the study. River Ganges experiences an array of anthropogenic pressure due to sewage and industrial discharge, mass bathing etc. It presents the impact of spatial divergence on the bacterial community structure and composition. Viral and bacterial communities are important for ecosystem function as they are involved in critical biogeochemical cycles and controlling host abundance. This study investigates riverine communities around a rural town that influences local water inputs. River confluences are interesting ecosystems to investigate for their microbial community structure and functional potentials. River Ganges is one of the most important and holy rivers of India with great mythological history and religious significance. The Yamuna River meets Ganges at the Prayagraj (formerly known as Allahabad), India to form a unique confluence. The influence of Yamuna River on taxonomic and functional aspects of microbiome at this confluence and its downstream remains unexplored. Results revealed differences in the relative abundance of bacterial and *archaea*l communities across the confluence. Grouped by the confluence, a higher abundance of Proteobacteria and lower abundance of Bacteroidetes and Firmicutes was observed. This study shows the microbial community variations found in river water effectively by using QIIMEbioinfomatical tool.

**Keywords**

Metagenomics, water analysis, River Ganga, microbial population, NGS

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# Building Comfort Index (BCI) For Civil Engineering Indoor Laboratories in Unipark Suria, Selangor, Malaysia

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**Nur Widad Roslan,** Faculty of Business, Information and Human Sciences, Infrastructure University Kuala Lumpur, Unipark Suria, Jalan Ikram – Uniten, Kajang, Selangor, Malaysia

**Suraya Amirrudin,** Faculty of Business, Information and Human Sciences, Infrastructure University Kuala Lumpur, Unipark Suria, Jalan Ikram – Uniten, Kajang, Selangor, Malaysia

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**Abstract**

Laboratory is an important place for civil engineering student to learn about material strength, material properties and types of experiment for different purposes. The Civil Engineering Indoor Laboratories in Unipark Suria are constantly being used by Infrastructure University Kuala Lumpur (IUKL), Selangor, Malaysia's students and staffs and IKRAM Engineering Selangor, Malaysia's staffs as well since IUKL and IKRAM shared multiple laboratories together. Hence, the aims of this study is to determine the Building Comfort Index (BCI) of Civil Engineering Indoor Laboratories in Unipark Suria, to analyse the Building Comfort Index (BCI) of Civil Engineering Indoor Laboratories in Unipark Suria and to propose suitable Building Comfort Index (BCI) for Civil Engineering Indoor Laboratories in Unipark Suria. Seven laboratories temperature, humidity and noise level data were collected and analysed by using Building Comfort Index (BCI) developed by Siti Nur Aliaa Roslan (2017). The analyses showed that five from seven of the laboratories obtained overall BCI of category 2 (Less Comfortable) and two from seven of the laboratories obtained overall BCI of category 3 (Comfortable).

**Keywords**

Building comfort index, BCI, comfort index of laboratory, comfort condition

# A Secured Machine Learning Industrial Mobile Cloud Computing Algorithm for Spammer Detection

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**Aachal Wani,** Department of Computer Science & Engineering, JDCOEM, Nagpur, India

**Abstract**

A mechanical adaptable structure is major for present day age in the Internet of Things. It guarantees the regular most remote extents of machines and the guideline of present day age. Notwithstanding, this trademark can be utilized by spammers to ambush others and effect mechanical creation. Customers who basically offer spasm, for instance, association with sicknesses and movements, are called spammers. With the advancement of versatile framework affirmation, spammers have included into social unlawful association with a conclusive objective of bit of breathing space improvement, which has made perplexity and overpowering fiascoes present day age. It is difficult to ascertain spammers from essential customers inferable from the traits of multidimensional data. To address this issue, this paper proposes a Spammer Identification plan subject to Gaussian Mixture Model that utilizations AI for mechanical flexible structures. It gives important undeniable check of spammers without relying upon flexible and faulty affiliations. SIGMM joins the presentation of knowledge , where each customer center point is consolidated with one class within the improvement procedure of the model. We approve SIGMM by disengaging it and reality mining check and mutt FCM get together count employing a versatile structure dataset from a cloud server. Delight results show that SIGMM butchers these past plans like survey, exactness, and time multifaceted structure.

**Keywords**

Gaussian Mixture Model, spam, FCM, fiascoes, Spammer

# Fermentation Process of Dry Cocoa Beans through Extremely Low Frequency (ELF) Magnetic Field Exposure

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**Abstract**

Several studies have found and proved that exposure to Extremely Low Frequency (ELF) magnetic fields can cause the proliferation of cells or bacteria. Meanwhile, bacteria play an essential part in the fermentation process. Thus, this study aims to examine the fermentation process of non-fermented dry cocoa beans using Extremely Low Frequency (ELF) magnetic field exposure. The sample of this study was 30 kg of non-fermented dry cocoa beans divided into 10 sample bags of 3kg each and grouped into 4. The control group (K) consisted of 1 bag while the rest bags were divided into 3 sample bags exposed to an ELF magnetic field with intensities of 100 μT (E-100), 200 μT (E-200), and 300 μT (E-300). ELF magnetic field exposure was carried out at the beginning of the fermentation process with variation in the exposure time of 15 minutes, 45 minutes, and 75 minutes. During the fermentation process, temperature measurements were conducted. Moreover, moisture content measurements were also conducted during the drying process in the sun for up to 3 days. At last, measurements of pH and alcohol content were carried out on dried cocoa beans. The findings showed that there was no significant temperature change ($p > 0.05$) during the fermentation process. A decrease in the moisture content of cocoa beans during the drying process was proven to be faster in the sample group exposed to the ELF magnetic field compared to those in the control group. The alcohol and pH of dried cocoa beans from the sample group exposed to the ELF magnetic field were significantly higher than those in control ($p < 0.05$). The highest alcohol content was found in the sample group which was exposed to the intensity of the ELF of 200 μT for 45 minutes. Conclusion: Exposure to ELF magnetic fields can increase the fermentation activity of dry cocoa beans. This indicates that exposure to ELF magnetic fields in the fermentation process of cocoa beans might improve the quality of non-fermented dry cocoa beans.

**Keywords**

Extremely Low Frequency, pH, moisture content, alcohol content

# The Nexus of Micro Planning and Bionomic Approach: in Reply to Pandemic Resistance Development

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**Djaka Marwasta,** Faculty of Geography, University of Gadjah Mada, Indonesia

**Abstract**

Broach a subject on planning, it has entirely shocked by the wide spreading of contagious outbreak. Many more ways have been undertaking in order to avoid worsen health living quality. One of the toughest parts of this is built environment because development involves a huge of factors and tends to generate into degraded-complex city. Therefore, micro planning which is based on bionomic approach is proposed as one of choices to the preventions of unexpected occurrences. It is well that more individual and smaller area coverage such as micro planning for villages. Despite several limitations to implement micro planning, the hope for pandemic resistance development is convincingly a dream for everyone.



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# Toward an Autonomous Robot Guide and Personal Transporter

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**Mr. Omar Sobhy,** American University of Sharjah, Sharjah, UAE
**Dr. Michel Pasquier,** American University of Sharjah, Sharjah, UAE
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**Abstract**

This paper presents recent research on the development of a personal autonomous guide and transporter that aims to address various transportation related issues such as availability, traffic, pollution, energy, and climate. A robot guide prototype based on the Loomo platform was developed to be operated either manually by the user or to navigate autonomously to the user's location then to his/her destination. Built-in robot capabilities were extended with mapping, localization, and routing services. The map and the location of the robot are updated dynamically based on signals from on-board sensors and BLE beacons placed within the environment. Routes are computed in real-time while obstacles are actively detected and avoided. A mobile application allows users to call a robot for assistance, specify a destination, and take control in personal ride mode. Speech control and feedback are also available. A scalable system architecture was designed to serve many users and employ multiple robots according to the usage scenario. The current prototype has been demonstrated to guide visitors within university buildings. Limitations inherent to the Loomo robot currently prevent outdoor use or computer-controlled ride mode, but the modular system architecture and its localization and navigation services could be extended to other platforms.



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# Flow Visualization of Footballs to Analyze its Performance and the Knuckling Effect

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**Sidharth Babu,** SCMS School of Engineering and Technology, India

**Abstract**

The design of a football entails consideration of various aerodynamic parameters to optimize its flight characteristics inclusive of surface roughness, number of panels, panel shapes, seam angles etc. The layout of football has advanced from the standard 32-panels to the 6 panels with different panel shapes. The primary objective of this study is to determine the influence of the surface roughness design parameter of selected and designed balls a smooth sphere, 32 panels football and FIFA 2014 football Brazuca on their aerodynamics, which is assessed by the flight traits such a drag force, drag coefficient and lift coefficient in CFD Analysis. The end result of these effects with and without surface roughnesses are defined within side the paper and are used to give an explanation and apprehend the reasons behind the unusual phenomenon of knuckling effects of footballs.



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# Analytical Solution of Some Nonlinear Equations Arising in Heat Transfer

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**Abstract**

Heat transfer is a very important process in many engineering and scientific applications. It is mostly governed by linear or nonlinear differential equations. It can be challenging sometimes to solve the governing equations especially if they are nonlinear. In this paper modified variational iteration method is used to obtain analytic solution of some nonlinear equations arising in heat transfer. This method is developed by change in the formulation of variational iteration method. The solution is considered as an infinite series converging towards the exact solution rapidly. All computation work has been performed in MATHEMATICA.



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