



9th International Conference on Recent Challenges in Engineering and Technology Hybrid Conference **ICRCET-2021**

20th - 21st November, 2021

Bali, Indonesia



Organized By

Institute For Engineering Research and Publication (IFERP)

ISBN : 978-93-92105-27-2



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Recent Challenges in Engineering
and Technology
(ICRCET -2021)

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www.iferp.in

Co-Host By

Udayana University

Bali, Indonesia

Universitas Mercu Buana

West Jakarta, Indonesia

Publisher: IFERP Explore

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IFERP-Explore

Editorial:

We cordially invite you to attend the **9th International Conference on Recent Challenges In Engineering and Technology (Virtual) (ICRCET-21)** on **20th – 21st November, 2021**. The main objective of **ICRCET-21** 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 Recent Challenges in Science 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 September 2021, the Organizing Committees have received more than 55 manuscript papers, and the papers cover all the aspects in Science and Technology. Finally, after review, about 20 papers were included to the proceedings of **ICRCET-21**.

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of **ICRCET-21**. 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 **9th International Conference on Recent Challenges in Engineering and Technology- 2021** this year in the month of November. The main objective of **Engineering and Technology** is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The session will serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and be known as a thoughtful leader.

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



Rudra Bhanu Satpathy

Chief Executive Officer

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**9th International Conference on
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**Bali, Indonesia
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Keynote Speakers



Prof. Moshe Vardi

Professor at Rice University
Bellaire, Texas, United States

About :

Moshe Y. Vardi is University Professor and the George Distinguished Service Professor in Computational Engineering at Rice University. He is the recipient of several awards, including the ACM SIGACT Goedel Prize, the ACM Kanellakis Award, the ACM SIGMOD Codd Award, the Blaise Pascal Medal, the IEEE Computer Society Goode Award, and the EATCS Distinguished Achievements Award. He is the author and co-author of over 650 papers, as well as two books. He is a fellow of several societies, and a member of several academies, including the US National Academy of Engineering and National Academy of Science. He holds seven honorary doctorates. He is a Senior Editor of the Communications of the ACM, the premier publication in computing.



Professor Marwan Al-Akaidi

Vice President for Research & Innovation
American University in the Emirates
Dubai - UAE
Chair SPC
IEEE UK & Republic of Ireland

About :

Experienced Vice President For Academic Affairs with a demonstrated history of working in the education management industry. Skilled in Analytical Skills, Lecturing, Leadership, Data Analysis, and Strategic Planning. Strong education professional with a Doctor of Philosophy (PhD) focused in Optical and Communication Engineering from Loughborough University



Dr. Eng. Deni Shidqi Khaerudini

Senior Research Fellow Research Center for Physics National Research and Innovation Agency (BRIN),

Puspiptek Serpong, South Tangerang, Banten Indonesia

About :

Dr. Deni is a Senior Research Scientist at Research Center for Physics (RCP), Institute of Engineering Sciences, National Research and Innovation Agency (BRIN), Indonesia. He has also been a faculty member at the Department of Mechanical Engineering, Universitas Mercu Buana, since 2017 to present. He received his Dr. Eng. in Energy Conversion Engineering, specifically on solid oxide fuel cells, from Hirosaki University, Japan in 2016. He received various awards including the 2015 doctorate student research excellence award from the President of Hirosaki University. Dr. Deni has 14 patents, 1 licensed (commercialized) patent, 1 trademark, 1 industrial design, and has published over 70 scientific papers with an h-index of 10 with more than 300 citations.



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Dr. Deni is a Senior Research Scientist at Research Center for Physics (RCP), Institute of Engineering Sciences, National Research and Innovation Agency (BRIN), Indonesia. He has also been a faculty member at the Department of Mechanical Engineering, Universitas Mercu Buana, since 2017 to present. He received his Dr. Eng. in Energy Conversion Engineering, specifically on solid oxide fuel cells, from Hirosaki University, Japan in 2016. He received various awards including the 2015 doctorate student research excellence award from the President of Hirosaki University. Dr. Deni has 14 patents, 1 licensed (commercialized) patent, 1 trademark, 1 industrial design, and has published over 70 scientific papers with an h-index of 10 with more than 300 citations.

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9th International Conference on Recent Challenges in Engineering and Technology

20th - 21st November, 2021

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ABSTRACTS

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Topical issues of diagnostics of the technical condition during the operation of turbine and pumping equipment of pumped storage power plants in Russia

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Abstract

The article discusses the diagnostics of pumping and turbine equipment as one of the key factors in ensuring high efficiency of operation of pumped storage power plants (PSPP). The conditions and features of the turbine and pumping equipment of the PSPP and their influence on the efficiency of the entire PSPP cycle are analyzed. An overview of the approaches to the operation of turbine and pumping equipment adopted at Russian PSPPs, methods of assessing the technical condition of equipment and the application of diagnostic results during operation and the corresponding regulatory and technical documentation is given.

Characterization of Produced Water from Petroleum Hydrocarbons Terminal

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Abstract

Produced water (PW) is the largest by product of oil and gas extraction. It contains both organic and inorganic components that can harm the environment. However, the produced water contents are different according to the area it is produced. There are a few factors that can affect the content compositions such as type of reservoir, geographic location of field, geologic formation, type of hydrocarbon being produced and lifetime of the proposed reservoir. This study analyses the contents via produced water characterization which has been collected from five different sampling points from a petroleum hydrocarbon terminal. The characterization conducted includes pH, turbidity, salinity, total suspended solid (TSS), total dissolved solid (TDS), chemical oxygen demand (COD), biochemical oxygen demand (BOD), dissolved oxygen (DO), total oil and grease (TOG), polycyclic aromatic hydrocarbon (PAHs) analysis and MP-AES test which is to study the element content in the produced water. Results shows that the produced water characteristic of each produced water samples varies based on different sampling point. Produced water sample with higher amount of oil content affect others characteristic of the sample. Most of the samples were found not meeting the standard of EQA1974.

Index Terms

Produced water, organic and inorganic content, COD, BOD, TOG

A Comparison of Different Feature-Based Template Matching Techniques

Zainab Reda Alhalalmeh, Mansoura University

Moawwad Elmikkawy Ali, Mansoura University

Muhammad Ali Rushdi, Cairo University

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Abstract

Automatic detection and finding of objects such as posts, activity signs, and building corners in road scenes captured from a versatile mapping framework have numerous applications. Template matching could be a procedure that may consequently perceive the counterparts or correspondents of an object from multi-view pictures. This research used three feature-based template matching algorithms, SURF (Speeded up Robust Features), FAST (Features from Accelerated Segment), and BRISK (Binary Robust Invariant Scalable Key points), the comparison process done among these algorithms through calculate the accuracy and run-time for each algorithm. The Oxford-IIIT Pet dataset was used to test the three algorithms, the comparison process based on calculate accuracy and run-time for each algorithm three times based on number of images: first, using ten images, then twenty images, and finally thirty images, the comparison process results indicated that the SURF algorithm got the best accuracy and run-time among the others.

Index Terms

Template Matching, Feature extraction and detection, SURF, FAST, BRISK

Introducing the “Karawitan” Traditional Musical Instrument through Android-Based Virtual Reality

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Abstract

Karawitan is one of the legendary traditional musical instruments in Indonesia. It is unfortunate, based on a survey conducted, it turns out that many people, especially millennials, do not know this type of musical instrument. Therefore, an android-based application was built using virtual reality (VR) technology to introduce it further. Virtual reality works by manipulating the human brain to seem like feeling virtual things feels like real things. This application is developed using Unity 5.6 software with C# programming language. The instruments introduced are Saron, Bonang, Gender, Kendang, Siter, Suling (Flute), Gong Kempul, and Gong Ageng. In addition to images of musical instruments, the application is equipped with the sound of each musical instrument introduced. Application users can interact directly with traditional tools originating from Central Java in virtual objects that resemble natural objects. The immediate urgency with this VR technology application is to introduce several kinds of musical instruments with an attractive presentation and produce an android application that can provide insightful knowledge to the Indonesian people in particular and the world community in general. In addition, this research is also an effort to preserve traditional Indonesian musical instruments, namely "Karawitan," which has begun to be abandoned by millennial society and as a medium for promoting Indonesian arts and culture to foreign countries.

Keywords

Android, application, karawitan, traditional musical instruments, virtual reality

The Effect of Utilizing Cisco IT Essentials on Learning Outcomes in Computer Installation Processing Courses

Ihsanulfu'ad Suwandi, AMIK Lamappapoleonro

Zul Rachmat, AMIK Lamappapoleonro

Abstract

This study aims to determine the effect of using Cisco IT Essentials on student learning outcomes of the Informatics Management Study Program in the Computer Installation Processing course related to computer equipment installation materials as a digital demonstration simulation that can help lecturers and instructors to convey material to students so that hardware installation procedures are carried out. computers are more understood as a practical solution during the Covid 19 pandemic which was later described in an article at a conference. The use of Cisco IT Essentials in learning can affect student learning outcomes. In designing this learning media, researchers used the ADDIE development model. Precisely in the informatics management study program the test subjects were students of class 2019 the trials in this study were carried out three times, namely one-on-one trials on three students, small group trials on five students and field trials involving fifteen students. questionnaire. lecturers in field trials. Data collection techniques are validation, questionnaires and tests. Data Analysis Techniques is the proportion of validity, practicality and effectiveness. The results of this study are; (1) Cisco IT Essentials learning development process refers to the ADDIE model, namely analysis, design, development, implementation and evaluation; and (2) the resulting product is a valid Cisco IT Essentials Trainer learning with an assessment of 90% media experts, 91% material experts, 92% manuals, 81% lecturer responses, 81% student responses and 84% tests. Practically based on one-on-one trials 81.10%, small groups 84% and field trials 88.80%. Effectively used based on learning outcomes data of 0.72 with a high category on the gain test.

Index Terms

Cisco IT Essentials, Digital Simulation, Installation Materials, Practical Solution.

Tailored Manufacture of Chitosan-Based Composite Membranes with Silver Nanoparticles (AgNP) Fillers: Preparation, Characterization, and Antibacterial Agent

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Abstract

Chitosan powder and silver nanoparticles (AgNP) are materials of great interest to researchers due to their excellent properties and wide application potentials. Many studies have been done to improve the utilization of chitosan powder in various fields. One is improving the characteristics of chitosan (Ch) membranes. In this work, the manufacture of chitosan composites membranes was achieved by using Ag nanoparticles as fillers for a potential method in improving the physical properties. The composites membranes were made by a casting method using a solvent of acetic acid. The amount of AgNP used was 10, 100, and 1000 µg. Those membranes named as Ch-AgNP10, Ch-AgNP100, and Ch-AgNP1000, respectively. A pure chitosan membrane was also made, named Ch. The physical properties of those membranes have been measured by various techniques including Barrett-Joyner-Halenda (BJH), dynamic mechanical analysis (DMA), X-ray diffraction (XRD), and water uptake capacity. The functional group analysis conducted using Fourier Transform Infra-Red (FTIR) Spectrophotometer. The membranes have also been tested for the antibacterial properties against *Escherichia coli*, a gram-negative and *Staphylococcus aureus*, gram-positive bacteria using the Kirby-Bauer inhibition zone method. The results showed that the diameter of the pores of those composites membranes is smaller than Ch membrane, however, the diameter of the pores increased with increasing the amount of Ag nanoparticles added. The longest elongation is indicated by Ch-AgNP10. The highest value of Young's modulus (E), the tensile strength (TS), and the capacity of the water uptake is showed by Ch-AgNP100. The XRD pattern showed two characteristic peaks $2\theta=14.89^\circ$ and 21.27° which correspond to the chitosan and some new peaks at 2θ around 29° , 39° , and 47° , that corresponding to Ag nanoparticles. The functional groups observed in the composite membranes included OH and NH stretch, CH stretch, C=O, C-O-C, and metal oxide (Ag-O) which mostly shifted to the longer wavelength compared with Ch membrane. The composite membranes have antibacterial potency to the *E. coli*, but not to *S. aureus*. Therefore, based on those results, this study provided basic knowledge for the manufacturing chitosan-AgNP composites membranes with tailored characteristics with its application.

Keywords

Chitosan powder, silver nanoparticles (AgNP), composites membrane, physical properties, antibacterial activity.

Effect of Morphology and Percentage of Second Phase Content of Coconut Coir on the Impact Strength of Epoxy Resin Composites

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Abstract

The morphology of the second phase used as reinforcement in the composite material can be in the form of particles (powder), short fibers, or charcoal ash which affects the mechanical properties of the composite material. There have been many studies conducted on the mechanical properties of composite materials. However, it is still rare to present research results in the form of a regression model. This study was intended to examine the effect of the percentage of second phase content on the epoxy resin matrix composite that was displayed by the regression model for different morphology. From this study, it was found that the content of coconut coir in the resin matrix composite material was proven increased the impact strength 200% to 400% compared to pure resin. The percentage content (x) of the second phase has been shown to affect the impact strength (Y) of the specimen for every second phase morphology, which are expressed in the regression models. The regression model for short fiber is: $Y=0.0969x^3-1.2367x^2+4.8216x+1.3705$, for charcoal ash is: $Y=0.14789x^3-1.6467x^2+5.1311x+1.3705$, and coconut coir powder is: $Y=0.0757x^3-0.9789x^2+3.7955x+1.3705$. The most optimum specimen in this study was a specimen with a second phase of 4 wt.% short fiber.

Index Terms

Morphology, the second phase, impact strength, epoxy resin.

Designing Intelligent Control System for Wheeled Robot Car for Handling COVID 19

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Abstract

Currently, the development of the COVID-19 outbreak continues to increase throughout the world, including in all provinces in Indonesia. The central and local governments in Indonesia have taken strategic policies on health protocols in handling the spread of the COVID-19 virus in a targeted and measurable manner, such as prevention policies and treatment policies. However, the development of this outbreak has not shown any signs of decreasing its spread. In general, the treatment of patients at this hospital, such as at the Udayana Hospital (RSPTN), is still done manually, so there are some medical circles that are also exposed to the COVID virus. Therefore, we conducted research on “Designing a Wheeled Robot Car Intelligent Control System for Handling COVID 19”. This paper discusses the effect of the PID parameter value on the overshoot signal of the dc motor rotation speed. Testing the movement speed of the assisting robot car of Udayana 02 (Ratna02) by using a variation of the control PID amplifier. This wheeled robot car is a robot car that has a function as a room neutralizer from the COVID virus by spraying oxygen, illuminating the room with ultraviolet (U.V) lights, helping transport patient logistics materials, and Standard Personal Protective Equipment (PPE). The robot will be controlled remotely by the operator using artificial intelligence. It is hoped that the use of robotic power can help reduce the impact of the COVID-19 outbreak in the hospital environment.

Key words

Wheeled Robot, Intelligent Control, Covid19, Object Detection, PID

The Effect of Service Quality and User Satisfaction on User Loyalty of Information and Communication Technology in Lapan

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Abstract

This study aims to determine the effect of service quality (X) on user satisfaction (Y) and the loyalty of ICT users in LAPAN directly or indirectly. The number of samples in this study was 278 respondents from a population of 1,191 LAPAN employees based on the Slovin formula with an error of 6%. The data collection technique was carried out by purposive sampling and proportional sampling, data collection was carried out in June 2021. Data analysis was carried out using the path analysis method. The results showed that service quality (X) had a direct positive and significant effect on user satisfaction with LAPAN ICT services (Y); (2) User satisfaction (Y) has a direct positive and significant effect on the loyalty of LAPAN ICT service users (Z); (3) Service quality (X) has a direct positive and significant effect on the loyalty of LAPAN ICT service users (Z); and (4) service quality (X) has not a positive and significant indirect effect on user loyalty (Z) through user satisfaction with LAPAN ICT services (Y).

Index Terms

Quality of service, Customer Satisfaction; Customer Loyalty, Path Analysis

Histogram Orientation Gradient for Offline Signature Verification via Multiple Classifiers

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Abstract

In the last decade, offline handwritten signature research has been increasing, as a common way for human authentication through biometric traits, despite the common of this method but it is not a trivial task, whereas, the difficulty in verifying a signature stems from the inability of anyone to sign in the same way each time. In this paper, we used HOG for extracts features from genuine and forged signatures, and four widely used classification algorithms, SVM (Support Vector Machine), SVR (Support Vector Regression), KNN (K-Nearest Neighbors) and DT (Decision Trees), these algorithms are compared to calculate the run time and accuracy for test-set consist of signature images (genuine and forgery). Four classifiers have been applied using two dataset UTSig and CEDAR datasets; where run time and accuracy were calculated for each classifier in the verification phase, the results showed that the for UTSig dataset SVM and SVR got the best accuracy (92.93), and the DT got the best run time (0.04) result among other classifiers, while for CEDAR dataset SVM, SVR and DT got the best accuracy (99.77), and the DT got the best run time (0.06) result among other classifiers.

Keywords

Signature Verification; HOG features extraction; KNN; SVR; SVM, DT; UTSig; CEDAR

Performance Modification of SCADA System Design for the Geothermal Power Plant 3 MW Kamojang - Indonesia

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Abstract

In the operation of the Geothermal Power Plant (GPP) 3 MW Kamojang - Indonesia, which consists of several instruments and devices whose data is in the form of physical addresses and device memory addresses that can be accessed via ethernet or via Modbus TCP, a real-time monitoring system and its supporting data are mandatory for providing easier for operators and engineers. For this reason, the monitoring display underwent design modifications both from the software side, including updating the SCADA (Supervisory Control And Data Acquisition) version, mimic SCADA, increasing the number of tags, operator level, data and graph records, and alarms as well as from the hardware side in the form of monitors and PCs. The authors have designed a modification of the SCADA system using indusoft software to mimic SCADA which includes the entire display, starting from the overview screen display, turbine screen, steam pressure control screen, condenser level control screen, parameter setting screen, SR489 screen, screen Woodward, screen Bassler, screen PM 710, screen alarm, screen graph, screen alarm, and trip. Modifications have also been included for the FT (flow transmitter) formula and have prepared data to be used as an evaluation process for the performance of the GPP 3 MW Kamojang-Indonesia. The SCADA is connected to PLC as the main controller and electrical devices such as SR489, Woodward, PM710, and Basler so that the SCADA becomes a data center for all devices that can make it easier for operators to monitor all the data. This paper describes the performance modification of the SCADA in a plant process, and also the SCADA architecture for the GPP 3 MW process. The interactive SCADA configuration with an attractive graphic display will greatly assists the operators in facilitating the operation of the power plant

Keywords

SCADA, Ethernet, Modbus TCP, Geothermal Power Plant, Kamojang

Increasing Power Supply Reliability of the Distributed Generation Network

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Abstract

Today, there is an active development of distributed generation networks, but this development is undoubtedly associated with reliability problems. Newly constructed microgrid networks should have the ability of automatic restoration process after emergencies to short the downtime of load. For that purpose in this paper, the control model of the inverter with the automatic restoration algorithm was developed. All the algorithms were designed and verified on the RTDS simulator.

Index Terms

Distributed generation, virtual inertia, machine learning, power restoration.

Microprocessor Interfacing: Bidirectional Motor, Automata Vehicular Locomotion

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Abstract

This paper intends to establish an automaton capable of serial communication and performing basic vehicular locomotion as means of enhancing applications over various fields not limited to: (1) uses in environments hazardous towards personnel, or (2) serve as a baseline for control systems acting as a safety net for correcting erroneous human input, like adjusting motor actuators when the user is recklessly driving. Using a programming block to provide instructions on the two motors, the automaton is test fitted with instructions to perform vehicular movement.

Keywords

Automata, Automaton, Bidirectional, Control System, Vehicular Locomotion, Microcontroller, Motor, Programming Block, Serial Communication

Software Quality Management Practices in Software Projects: A Systematic Literature Review

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Abstract

Previous studies have shown that software quality has a significant impact on customer satisfaction. However, it is difficult to guarantee the quality of any software. This difficulty is reflected in the cost of ensuring software quality, where it costs 33% of the overall project cost. Therefore, software quality management (SQM) is required to manage software quality result and costs. A systematic literature review (SLR) is used to identify what are the existing SQM practices in software projects. A total of 31 papers from 614 were identified as the result of SLR selection. The SQM practices from related studies were mapped into three main SQM activities, namely quality planning, quality assurance, and quality control. These practices are then integrated into software development process by mapping it into the SDLC phases of which they are conducted.

Index Terms

Software development methodology, software quality, software quality assurance, software quality control, software quality management, software quality planning

Synthesis of Silicon Carbide from Silicon and Activated Carbon through Mechanical Milling and Heat Treatment

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Abstract

Silicon carbide (SiC) has been synthesized using a simple method without any additional additives. The synthesis has been carried out by mixing silicon powder with activated carbon powder with 1:1 molar ratio using High Energy Milling (HEM) for 40 hours. After milling, heat treatment was applied with and without argon as the inert gas. The sample was held for 2 hours at maximum temperature of 1300°C (without argon) and 1100°C (with argon) followed by natural cooling down to room temperature. XRD, FTIR, and SEM investigation were carried out toward sample before and after heat treatment. From XRD profiles, silicon was the only phase detected in the sample before heat treatment indicating no reaction occurred between silicon and carbon during milling. After heat treatment without argon, mixed silica phases in form of cristobalite and quartz were detected. It was estimated that all carbon had been burnt becoming carbon dioxide and the remaining silicon oxidized becoming silica. The β -SiC phase was obtained after heat treatment under argon gas atmosphere. However, silicon and silica phases were still detected. All FTIR results support the XRD data in general. SEM images show that after milling for 40 hours, spherical particles with a size of about 250 nm were formed from a mixture of silicon and activated carbon. Flakes of silica were formed after heat treatment without argon. Spherical particles with diameter of below 200 nm were observed after heat treatment under argon atmosphere and according to the XRD result, these particles were a mixture of β -SiC, silicon, and silica phases.

Keywords

Silicon carbide, silicon, activated carbon, mechanical milling, heat treatment.

Lessons Learned from COVID-19 Impact: Construction Contracts and Future Strategies

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Abstract

Construction is a driving industry for every sector to assure development. Since the occurrence of Coronavirus disease (COVID-19) in December 2019, the construction is one of the affected industries by the event. The pandemic has affected the supply chain, labor force and raised claims. Most recent studies are conducted to respond to the pandemic with the agreed contracts despite the unforeseen event clauses. This paper presents lessons learned from the pandemic and suggestions for future contract strategies to reduce the impact in similar events. In order to set future strategies, first literatures are extensively reviewed to identify the severe impact of the pandemic on construction industry. Secondly, contractual provisions related to unforeseen conditions are analyzed from international contracts forms including FIDIC, JCT and NEC. Then contract provisions are suggested to reduce the contractual claims for future similar events in construction industry.

Index Terms

COVID-19 pandemic, Construction contracts, Future strategies

Qualitative Research: Significance of Health Management Information System in Government Hospitals of Tamil Nadu, India

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Abstract

Tamil Nadu Health System Project (TNHSP) is long term strategic plan of the Government of Tamil Nadu, partnered with the World Bank, NRHM, and ICMR to develop a new Health Information System (HIS) in Tamil Nadu. It should be greatly reachable, impartial and valuable. Health Management Information System (HMIS) is a amalgamation of Information Technology and Healthcare management. The study is (i) to understand the impact and importance of Tamil Nadu Health System Project implemented in all Government Hospitals (GHs) of Coimbatore District and (ii) To understand the functioning of Hospital Management System (HMS) in all GHs. Coimbatore district is taken as sample among 32 districts in Tamil Nadu for the convenience of the researcher for collecting data from all Government Hospitals. The primary data are collected from nine Government Hospitals (Institutions) under Coimbatore district and consolidated reports are collected at the office of Joint Director of Health Services (JDHS), Coimbatore. The only secondary data are presented and explanations are based on tables provided by health workers and authorities. Hospital Management System (HMS) and Health Management Information System (HMIS) play a vital and essential role in modern healthcare. The accomplishment of an information system is in the hands of end users' satisfaction and adequate training given to them.

Key words

Health Management Information System (HMIS), Hospital Management System (HMS), Quality Healthcare Services, Tamil Nadu Health Systems Project (TNHSP).

Technique Mixed Enzymatic Virgin Coconut Oil and Ethanol Extract of Lemongrass Improving Antioxidant and Ester Content

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Abstract

Lemongrass ethanol extract component as an effort to increase the antioxidant activity of enzymatic Virgin Coconut Oil (VCO). The purpose of this study was to analyze the antioxidant activity and its ester compounds in various concentrations of enzymatic VCO and ethanol extract of lemongrass. The analytical method to measure the antioxidant activity in the enzymatic VCO used DPPH and lauric acid by gas chromatography-mass spectrometry. The results showed that there was an increase in antioxidant capacity and esters in the VCO-ethanol extract of lemongrass compared to the control VCO. The antioxidant activity increased in a mixture of 10 ppm concentration obtained about 70% immersion percent while the detected esters were methyl laurate ranging from 8.30-16.98% and methyl linoleate about 2% against lemongrass compared to control VCO. This is interesting to develop because linoleate has potential as an antifungal compound.

Keywords

antioxidant, lemongrass ethanol extract, enzymatic, ester, VCO.

A Novel method of EEG data acquisition, SVM and ELM feature extraction and feature space creation for detection of the Seizure Classification

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Abstract

In this proposed we describe a very simple and then very fast method of the data acquisition, feature extraction and then the feature space creation for the epileptic seizure detection. The EEG that is used to recorded the scalp of the electroencepolgram (EEG) dataset [1, 2] that is used to collect the children's Hospital Boston from the 22 predicate patients that has having 192 intractable seizures (That is available as the CHB-MIT database) that is used to assess this simple approach against existing one [1, 3] with very positive result reaching up to 99.48% sensitivity.

Risk Management of Substation Construction Project Using Failure and Mode Effect Analysis on PT XYZ

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Abstract

The Substation Project (GI) is a development structure which is a sub-system of the transmission or distribution system of electricity. There are several stages of work on GI projects such as, design, civil works, and electrical works. Each has different characteristics so that there are various kinds of risks that can cause losses in costs, materials and time. Based on this, a risk analysis is needed to determine. This study focuses on risk management on the substation construction project at PT XYZ with the aim of identifying what risks can arise and their levels, the impact of the risks that occur, and how to mitigate them. In this study, the Failure Mode and Effect Analysis (FMEA) method was used to conduct analysis, a risk matrix to evaluate risk, and to determine risk mitigation, a Focus Discussion Group was used with employees from PT XYZ who had more than 5 years of experience in this field. The results of this study indicate that there are 28 risk variables found and 17 of them are included in the critical category. After the evaluation, it was found that 1 was in the high risk category and 16 was in the medium category. Then all existing risks are given mitigation in accordance with the results of the Focus group discussion.

Keywords

Substation Project, Risk Analysis, Risk Matrix, FMEA, Risk Mitigation

A Distributed Forward Aware Factor Based Greedy Routing Through Stateless Routing protocol for Wireless Sensor Network towards employing Homomorphic Energy based Encryption

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Abstract

Due to the wireless nature, the sensors node data are prone to location privacy of source and classification of the packet by unauthorized parties. Data encryption is one of the most effective ways to thwart unauthorized access to the data and trace information. Traditional wireless network security solutions are not viable for WSNs. In this paper, a novel distributed forward aware factor based heuristics towards generating greedy routing using stateless routing is proposed for wireless sensor network. The model employs the Homomorphic Energy based encryption technique. Energy based Encryption model is devoted as Homomorphic mechanism due to their less computational complexity. Additionally privacy constraint becoming a critical issue in the wireless sensor networks (WSNs) because sensor nodes are generally prone to attacks which deplete energy quickly as it is exposed to mobile sink frequently for data transmission. Through inclusion of the Forward aware factor on the Greedy routing strategies, it is possible to eliminate the attacking node which is depleting the energy of the source node. Heuristic conditions are used for optimizing the sampling rate and battery level for tackling the battery capacity constraints of the wireless sensor nodes. The Node characteristics of the propagating node have been analysed utilizing kalman filter and linear regression. The cooperative caching of the network information will enable to handle the fault condition by changing the privacy level of the network.

Keywords

Wireless Sensor Network, Location Privacy Preserving, Energy Based Homomorphism Encryption

Rapid Bathymetry Detection with Sentinel Application Platform (SNAP) Using Sentinel Imagery 2A

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Abstract

Indonesia is the largest archipelagic country where 77% of its territory encompasses coastlines, shallow waters to deep sea waters areas. One of the required important information for Indonesia particularly for protecting its rich marine habitat and supporting shallow-water navigation is bathymetry. Additionally, bathymetry information can be used to support several other purposes, such as shipping, determining the right area for ports, and determining coastal cultivation areas. Remote sensing technology has an important role to provide bathymetric information quickly and cover a wide area in an archipelagic country like Indonesia, mainly when field measurement is hindered by logistical issues due to the remoteness of target areas. This study attempts to contribute to the solution of the issue by performing bathymetry extraction using Sen2Coral algorithm available in Sentinel Application Platform (SNAP) image processing software. The specific purpose of this study is to rapidly derive bathymetry in shallow marine waters using Sentinel 2A data. The research location is in the islands of Putri, Melintang, Macan, Dolpin and located in Seribu Islands, Jakarta. The data used are Sentinel 2A imagery acquired on April 24, 2021, in situ bathymetry and tidal data. The results showed that Sentinel 2A can produce a depth range of 0 – 30.64 meters. The accuracy of the calculated bathymetric using Sentinel 2A is 68%.

Keywords

Bathymetry, Sen2Coral, SNAP, Sentinel 2A

The Effect of NaOH Catalyst on Hydrogen Production Produced through the Electrolysis Process of Seawater from Mangrove Area

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Abstract

This research was conducted to examine the volume of hydrogen, hydrogen production rate and hydrogen yield produced through the electrolysis process of seawater from mangrove area with 0.5 M, 1 M, and 1.5 M of NaOH as catalyst. The process was carried out using copper electrodes at a voltage difference of 12 V and an interval of 20 minutes for each measurement of hydrogen volume which was determined using the water displacement method. The lifetime of the copper electrode was also analyzed to determine the resistance of the electrodes to corrosion caused by chlorine. The results showed that an addition of NaOH catalyst can increase the hydrogen production by the electrolysis process of seawater around mangrove areas and the optimal catalyst is NaOH 1 M, which produced 671.8 ml of total hydrogen gas in 1700 minutes. The use of seawater from mangrove areas in producing hydrogen through the electrolysis process in addition with NaOH as catalyst, provided an opportunity to extend the electrode lifetime, prevent corrosion, and also to produce more hydrogen as a source of clean and environmentally friendly energy, as well as to promote conservation and rehabilitation of mangrove.

Keywords

catalyst, hydrogen, mangrove, seawater

The Effect of Clay Coating on Electrodes in Seawater Electrolysis Process to Produce Environmentally Friendly Hydrogen Energy

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Abstract

Hydrogen gas from seawater can be obtained through electrolysis process. However, until now, seawater electrolysis process has not been able to last long, because it contains chlorine that causes anodes to corrode. This study aims to analyze the effect of clay coating on electrodes to resist corrosion. The water displacement method is used to determine the volume produced during the electrolysis process, starting from 0 and progressed within 20 minutes of interval for each measurement until the hydrogen production reaches the saturation point. In addition to the volume, hydrogen rate and yield production tend to decrease after the electrolysis process lasts for a certain time. The results also show that the use of electrodes (copper) coated with clay has a longer resistance to corrosion due to chlorine contained in seawater, compared to electrodes (copper) not coated with clay. Electrodes (copper) that are not coated with clay have a shelf life of up to 9 hours and reach a maximum point of producing hydrogen at 280 minutes of 15 ml; While the electrode coated with clay turned out to have a durability of up to 12 hours and reached the maximum point in producing hydrogen at 560 minutes of 15.4 ml.

Keywords

Hydrogen, Electrolysis, Water displacement, Electrode, Clay

Mapping MSME's Performance In Brebes Regency Using A Combination Method of Technometric and SCOR

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Abstract

In a region like Brebes Regency, Micro, Small, and Medium Enterprises (MSMEs) is an important sector since it can improve the welfare of its residents. However, owing to the lack of technometric maps of the MSMEs and their supply chain that may be used as a reference, the reality that occurred in the field was not clear. The study aimed to map the MSME technology capacity based on the TCC (Technology Contribution Coefficient) and develop the supply chain performance of the highest TCC. A combination method of Technometric and SCOR (Supply Chain Operations Reference) has been used to perform the measurement, and MSMEs of salted eggs, salted egg processing, shallot processing, Brebes Typical Coffee, and handicrafts that spread across Brebes Regency have been used as research objects. The findings of this study show that TCC value of 4 aspects including techno-ware, human-ware, info-ware, and orga-ware of the MSMEs in Brebes Regency relatively low i.e., 0.1685 and 0.2196 for salted egg MSMEs; 0.1550 and 0.1424 for salted egg processing MSMEs; 0.2542 and 0.2350 for shallot processing MSMEs; 0.2662 and 0.2712 for Brebes Typical Coffee MSMEs; 0.2309 and 0.2414 for handicraft MSMEs. While in 5 aspects based on the SCOR Model method are also relatively below the average i.e., 49.81 and 49.78 for salted egg MSME and salted egg processing MSME; 54.06 and 54.95 for shallot processing MSME and Brebes Typical Coffee MSME, 39.17 for handicraft MSME, although it was the MSME with the highest TCC. These indicated that a further improvement to the 4 Technometrics aspects needs to be carried out and the supply chain performance also required improvement to fit the changeable market demand. Guidance and assistance to the MSMEs in Brebes Regency is a must requirement. Ideally, techno-metric mapping and its supply chain performance should be done every 5 years or fewer, depending on the market demand condition which should be the right product, quality, quantity, price, and time.

Keywords

Industry, MSME, SCOR Model, Techno-metric

Reliability Evaluation of a Belt Conveyor System using CAS Mathematica

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Abstract

This article evaluates the performance of the belt conveyor system in a coal handling plant through reliability analyses. The belt conveyor system consists of twenty-three belt conveyors subdivided into six segments to ensure good maintenance practices. The performance of the coal handling plant is depended on the reliability of the belt conveyor system. The belt conveyor system is mathematically modelled using the Markovian birth-death concept for analysing the reliability. Various Chapman-Kolmogorov differential equations are formulated for all the system states and solved with the help of CAS Mathematica. The effect of every segment of the belt conveyors on the reliability of the system was analysed using different rates of failures and repairs of respective segments of the belt conveyors has helped the plant to identify the weak-links of the system that need improved maintenance practices to improve the overall performance of the plant.

Keywords

Markov process, reliability, belt conveyor system, performance evaluation, differential equations

The Use of Aluminum and Coconut Shell Waste for Hydrogen Production

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Abstract

Renewable energy applications should be prioritized in order to implement clean and environmentally friendly energy, one of which is hydrogen gas. Hydrogen gas production can be obtained through metal hydrolysis process, using specifically, aluminum cans waste, which would help the effort of aluminum waste recycling. The waste recycling effort is also carried out by adding organic waste like coconut shells. Both of these materials were used in this research for hydrogen gas production. This study aims to analyze the effect of the differences in the composition ratio of aluminum and NaOH solution mass, and the effect of activated carbon catalysts presence to hydrogen production. The method used in this study is experimentation, where the data is obtained, processed and then analyzed by using statistic's descriptive techniques to determine the effectiveness of hydrogen production. The results showed that the optimal ratio of aluminum and NaOH solution mass of 1:5 (Al 16.67%w.t), and the additional of activated carbon catalysts can affect the increase on hydrogen production (volume, rate, and yield), even in the condition of room temperature and pressure. These results provide the opportunity to utilize domestic waste recycling approach in producing hydrogen as a source of clean energy for the environment.

Keywords

activated carbon, hydrogen gas, metal hydrolysis, renewable energy.

Development of single-board computer-based self-driving car model using CNN-controlled RC car

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Abstract

One of the critical stages in developing an autonomous car is to test the AI controller model using an autonomous car prototype. However, the actual size prototype cars are quite expensive and may be dangerous if the fault in controlling action has occurred. Therefore, this research aims to prototype a small-scale autonomous car using an RC car with a single-board computer. We built the AI by using the convolutional neural network (CNN) method. The camera images were used as sensor input (training step), and the steering wheel angle and the car's speed as output. The first stage of this method is to collect training data carried out by recording images, steering angles, and car speed when the car is running on its track. The amount of data taken is 3000, 6000, 12000, and 24000 data. Another step is to perform deep learning training to the model, which has variations in convolution layers as 2, 3, 4, and 5. The next stage is testing the prediction of steering angle and car speed from image data using the trained model with lighting and the colour of the obstacles varied. The test found that the model with 24000 data and three convolution layers produced the slightest absolute prediction error at 0.18257.

Keywords

Self-driving Car, Jetson Nano, Deep Learning, Convolutional Neural Network

Evaluation of the Readiness Level of Information System Security at the BAKAMLA Using the KAMI Index based on ISO 27001:2013

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Abstract

Data, particularly security and safety data possessed by an agency, becomes very critical information that requires specific protection to ensure its security. To ensure data confidentiality, integrity, and availability, it is required to assess the security of information controlled by Bakamla. The KAMI index is a tool developed by BSSN to help agencies assess the maturity of their information system security. The KAMI Index is used to analyze the maturity level of information system security at Bakamla. Based on the assessment of the KAMI Index that has been carried out on the Information System at Bakamla, the result is Not Eligible. Therefore, actions based on certain standards are needed, one of which is ISO 27001:2013.

Keywords

KAMI Index, ISO, ISO 27001:2013, risk assesment.

Investigation of effect of mixing and inhibition towards stability of semi batch dry anaerobic reactor treating manure with straw

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Abstract

Dry anaerobic digestion (AD) facilitates higher volumetric loading rate and low pretreatment requirement. Dry AD is highly vulnerable to inhibition such as accumulation of volatile fatty acids (VFAs), free Ammonia Nitrogen (FAN) and non-biodegradable intermediates. This study investigates the effectiveness of using semi batch reactor to treat cow manure bedded with straw under dry AD conditions. By varying organic loading rates (OLRs) step wise, experiments were conducted in pilot scale semi batch reactor and parameters such as alkalinity, TS, VS, biogas volume, biogas composition, total ammonia nitrogen, free ammonia nitrogen, total VFA, acetic and propionic concentrations were measured. Step wise increased of OLRs caused to increase the withstand ability of microflora and decreased inhibition improving stability and performance. The optimum OLR recorded was 3.07gVS/L.d with a specific methane yield (SMY) of 0.170NLCH₄/gVSadded. Maximum Specific methane production rate (SMPR) reported at OLR of 3.69gVS added/L.d was 4.08 NLCH₄/L.d. Intermittent mixing caused to increase scum formation and subsequently mixing intensity was increased to overcome this problem, As a result of sudden increase in mixing intensity, inhibition increased and reactor performance deteriorated. Reactor was again fed stating with small OLRs and performance improved due to presence of high alkalinity in the system.

Keywords

Dry AD, inhibition, Acclimatization, Intermittent mixing, alkalinity.

Removal of Textile Waste Dye Agent by Photodegradation Catalysed by Iron Oxide Intercalated Bentonite

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Abstract

Liquid textile waste contains noxious chemicals including dye agents that are notoriously hard to remove, putting them as potential aquatic pollutants. Photodegradation is theoretically capable of breaking these pollutants down into simpler-harmless molecules that are safe to discharge. Photodegradation requires photocatalyst to increase the rate. In this paper, iron oxide intercalated bentonite is reported to be used as the photocatalyst in the photodegradation of liquid textile waste containing blue dye. The photodegradation was conducted with UV light under optimized pH, irradiating duration, and photocatalyst mass. The samples were analyzed to determine the decreases in the dye absorbances, BOD, COD, and TOC by the photodegradation process. The results suggest that the photodegradation effectively remove the pollutants as shown by $84.34 \pm 1.2\%$ decrease in the dye absorbance, $94.4 \pm 1.6\%$ in BOD, $88.9 \pm 1.1\%$ in COD, and $90.5 \pm 1.4\%$ in TOC. Furthermore, both BOD and COD values of the degraded waste fulfil the maximum concentrations allowed by the Indonesian government guideline.

Text to Braille conversion for real-time teaching (For Grade III Braille)

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Abstract

In the recent times , the universe is going to be completely electronic. Everything is accessible in a digital and virtual world and everyone is taking the benefit of that but the problem is what about the physically handicapped people . Can they also take the same benefit of the existing information ?.Most of the available information for the visually impaired people is in the e-books, magazines, and digital documents format. But when talked about implementing such a system in schools and colleges. No such provision has been made for it. Hence Real-time teaching becomes a big issue when it is addressed. The majority of the text to Braille conversion focuses only on the reproduction of the already available books and then their conversion into the Braille. Using the current project will be able to address the issue and help to teach the students in Real-time like the other normal students are taught in the school. For the implementation of this method, will be using a webcam, the language which this is using is Python, in Python this is using TESERACT and Arduino board and for the output, solenoids would act as a feeling mechanism for the blind students. The main reason for using Python language is that Python has extensive libraries which can be called and used. The productivity and the speed of Python are also very high and also the data structures used in Python are user-friendly and the most important thing is they can be easily learned.

Keywords

Tesseract, OCR, Python, Arduino, Physically disabled, real-time teaching.

Mitigating Security Concerns of Big Data Storage Using Intelligent Elliptic Curve Cryptography Algorithm in Multi-Cloud Environment

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Abstract

Multiple public and private clouds are combined and formed as a multi-cloud environment. There are numerous cloud services that may collaborate and interact with one other, and its objective is to allow users to evade vendor blocking. In the cloud computing context, multi-cloud data safety and privacy is a major challenge. The fact that cloud service providers have access to complex data is a big source of concern, when it comes to security and privacy. Cloud computing adoption in many industries, including the banking sector and government agencies, is hampered by this fear. Therefore, an intelligent cryptography solution is projected in this research, which prevents cloud service providers from directly accessing the user's data. The proposed method separates the file and stores the data on various cloud servers, according to its importance of sensitive data. The user determines whether or not the input file is classified as sensitive or non-sensitive. For sensitive files, different virtual machines (VMs) are used to store them, and for non-sensitive files, a single VM is assigned. The Elliptic Curve Integrated encryption Scheme (ECIES) technique is used to encrypt the files before they are uploaded to the cloud server. Users' original data cannot be openly accessed by cloud service providers using an intelligent ECIES cryptography approach suggested in this study. Our experiments have evaluated the security and efficiency of our technique, and the findings show that it is capable of effectively defending against the most common cloud-based threats while still requiring a reasonable amount of processing time.

Keywords

Cloud Computing; Data Privacy; Security; Elliptic Curve Integrated Encryption Scheme; Sensitive Data; Virtual Machine.

Role of Computational Intelligence Techniques in Diagnosing Alzheimer's disease at Early Stages: A Systematic Literature Review

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Abstract

Computer aided disease diagnosis with computational intelligence research has shown that several intelligent models have been developed to assess medical data and make assumptions about illness severity and early diagnosis. Many researchers find it difficult to anticipate and diagnose the deadly neurodegenerative disorders that fall under the category of dementia using medical image data. Alzheimer's is now the most common dementia, affecting around a third of all people. Many machine learning models have been developed, but there is still a lot of room for further improvement in the field of Alzheimer's disease detection and prevention. This article includes a thorough literature evaluation of machine learning approaches that have been developed to detect Alzheimer's disease at an earlier stage. As a result of these studies, budding Alzheimer's disease researchers will be able to better understand the extent of study in forecasting the illness via the use of artificial neural networks, support vector machines, and deep learning-based ensemble models.

Keywords

Dementia, Alzheimer's, Computational intelligence, soft computing , Image analytics, Machine learning, Deep Image analytics.

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