PRINCIPAL
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 0..

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INDRA GANESAN COLLEGE OF ENGINEERING

Madurai Main Road(NH-45B)Manikandam,Tiruchirapalli-620012

INTERNATIONAL CONFERENCE ON SOLID STATE MATERIALS APPLICATIONS AND FABRICATION TECHNOLOGY

(ICOSSMAAFT-2022)

10-02-2022

CONFERENCE PROCEEDINGS

ACADEMIC YEAR 2021-2022

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Preface

The International Conference on Solid State Materials Applications and Fabrication Technology is being organized by IGCE, Trichy, Tamil Nadu on 10/02/2022.

IGCE has a sprawling student friendly campus with modern infrastructure and facilities which complements the society and scrutiny of the major city of Trichy.

The, International Conference on Solid State Materials Applications and Fabrication Technology was a notable event which brings academic, researchers, Engineers, industry experts and students together.

The purpose of the conference is to discuss applications and developments in the field of Engineering and Technology Education which may can gives international values. Through proper scrutiny and prier reviewer quality papers were recommended by the conference committee. The conferences apply focuses on the tools and techniques for the development on current technology.

We are indebted to the efforts of all the reviewers who undoubtedly have raised the quality of the proceedings. We are earnestly thankful to all the authors who have contributed their research works to the conference. We thank our management for their support and encouragement. We thank our principal for his guidance. We are also thankful for the cooperative advice from our advisory chairs and co-chairs. We thank all the members of our local organizing committee National and International Advisory committee.

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Director's Desk.

It is a great pleasure that IGCE is organizing a International Conference on International Conference on Solid State Materials Applications and Fabrication Technology 10/02/2022, Trichy. The conference aims to be a key national forum for the exchange and discrimination of technical information on International Conference on Solid State Materials Applications and Fabrication Technology among academicians and practicing engineers, scientists in the domain of interest award the nation.

Engineering developments is an essential ingredient for the industrial and all sound development of any country. So keep this conference paves way for it. I would like to thanks to all the participants IGCE family who have helped me in making the conference success.

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Secretary Message.

It is a matter of commitment and pride for all of us to organize International Conference on Solid State Materials Applications and Fabrication Technology. We have beenthinking about organizing a conference for quite since time and the first aspect which we had to discuss was that would we be able to make it meaningful and fulfill the expectations of the participants and the aspirants.I am sure the technical and scientific program of the conference would certainly give the delegates an opportunity for fruitful discussions and stimulating interactions.I would like to thank the participants and conference committee for providing valuable conference the best.

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Principal Message

Education is an instrument to enhance the capabilities of human beings to become knowledgeable, creative who resulted in my usage to develop excellent educational facility. I am extremely happy as principal of IGCE, hosting a conference on "10/02/2022"

It is a participated gesture to provide a platform for graduates students and researches to present their work and seek expert's evaluation that provide insight in the work undertaken. I hope that the discussion, presentation appreciation and suggestions will help in improving their research work. I extend my heartful wishes to all the participants who have contributed in making this conference a great success. I feel flat with presentation and interactions with expert's students are exposed to the emerging trends in the field of engineering.

I would like to congratulate participated for contribution to this conference. I appreciate conference conveners, faculty coordinators of IGCE organizing this conference "International Conference on Solid State Materials Applications and Fabrication Technology".

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1. Investigation Into The Use Of Concrete Block Constructionin Low Cost Housing In The Western Cape

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Abstract: Addressing the pressing need for affordable housing in economically challenged regions, the study delves into the potential of concrete block construction to provide a durable and cost-effective alternative. The research methodology involves a multifaceted approach, encompassing feasibility analysis, structural integrity assessments, and an examination of thermal properties associated with concrete block construction.Experimental evaluations are conducted to empirically measure the performance of concrete block structures, while numerical simulations complement these findings, offering a comprehensive understanding of the material'sbehavior under various conditions. The feasibility analysis considers economic factors, availability of materials, and the adaptability of concrete block construction to the unique challenges posed by low-cost housing projects in the Western Cape. Structural integrity assessments focus on ensuring that the construction method meets safety standards and can withstand environmental pressures. The outcomes of this research aim to offer valuable information for policymakers, urban planners, and construction professionals involved in the development of affordable housing in the Western Cape. By providing a comprehensive assessment of concrete block construction, this study seeks to contribute to the ongoing discourseon sustainable and cost-effective housing solutions in economically challenged regions.

Key Words: Concrete Block Construction, Low-Cost Housing, Western Cape, FeasibilityAnalysis, Structural Integrity, Thermal Properties, Experimental Evaluation, Numerical Simulation, Affordable Housing Solutions.

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3. Effect Of Refuse Dump On Underground Water Quality

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Abstract: Refuse dumps, if not managed adequately, can act as potential sources of groundwatercontamination through the migration of leachate. The study employs a comprehensive approach,involving rigorous monitoring and analysis of groundwater samples obtained from locations in close proximity to a refuse dump. The parameters under scrutiny encompass a broad spectrum, including heavy metals, organic pollutants, and microbial content. The research aims to meticulously assess the extent of water contamination resulting from the influence of a refuse dump on underground aquifers. This involves not only identifying the presence of contaminants but also quantifying their concentrations to gauge the severity of the impact. By providing a detailed understanding of how refuse dumps can affect underground water quality, the study contributes to the ongoing discourse on sustainable waste management practices. The insights gained from the assessment can inform the development of strategies to mitigate the potential risks associated with refuse dumps, safeguarding the integrity of groundwater resources.

In summary, this detailed abstract outlines the research's methodological approach and the rangeof parameters considered, emphasizing the importance of understanding the intricate relationshipbetween refuse dumps and underground water quality for the development of effective environmental management practices.

Key Words: Refuse Dump, Underground Water Quality, Groundwater Contamination, LeachateMigration, Waste Management, Environmental Impact, Heavy Metals, Organic Pollutants, Microbial Content, Sustainable Practices.

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2. Comparative Analysis And Prediction Of Remediation Rates OfMicrobes In Simulated Polluted Soil Samples

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Abstract: Microbial remediation holds promise, and this study seeks to contribute by assessing and predicting the efficiency of various microbial strains in degrading pollutants within simulated soil environments. The experimental approach involves the creation of simulated polluted soil samples, allowing for controlled testing of different microbial populations. The research collects comprehensive data on pollutant degradation rates under these controlled conditions, considering distinct microbial strains. Statistical analyses are then employed to discern patterns and variations in the remediation performances of these microbes. Additionally,modeling techniques are applied to predict and compare remediation rates. These models take into account factors such as microbial activity, pollutant types, and environmental conditions.The predictive aspect of the study aims to offer insights into the potential success of different microbial strategies for soil remediation, guiding future efforts in environmental management.The outcomes of this research are expected to provide a nuanced understanding of the comparative efficacy of microbial remediation in simulated polluted soil samples. The insightsgained from statistical analyses and predictive models can informdecision-making processes related to the selection and optimization of microbial strains forefficient soil pollutionremediation. In summary, this detailed abstract outlines the methodological approach and expected contributions of the research, emphasizing the importance of the comparative analysisand predictive modeling for advancing microbial remediation strategies in the context of soil pollution.

Key Words: Comparative Analysis, Prediction, Remediation Rates, Microbes, Simulated Polluted Soil, Soil Pollution, Environmental Remediation, Microbial Strains, Statistical Analysis,Modeling Techniques.

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4. Kinetics Of Biosorption O Three Heavy Metals By Five SelectedMicroorganisms

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Abstract: Biosorption, a biologically mediated process, exhibits potential for environmental remediation, particularly in the removal of heavy metals from aqueous solutions. The study aimsto unravel the intricate kinetic aspects of this biosorption process, shedding light on howdifferent microorganisms dynamically sequester heavy metals over time. The five chosenmicroorganisms undergo rigorous examination for their biosorption capacities against three target heavy metals. Experimental analyses are conducted to monitor and quantify the uptake kinetics, providing a detailed understanding of the temporal dynamics of metalsorption by thesemicroorganisms. The heavy metals selected for investigation represent pollutants commonly found in aqueous environments. The outcomes of this research are anticipated to contribute valuable insights into the efficiency and applicability of the selected microorganisms for biosorption purposes. Understanding the kinetics of biosorption is crucial for optimizing environmental remediation strategies, particularly in the context of heavy metal removal. The research findings have potential implications forwater treatment processes and the developmentof sustainable solutions for mitigating heavy metal pollution. In summary, this detailed abstract outlines the research's methodological approach, emphasizing the focus on biosorption kinetics, the selection of microorganisms, and the relevance of the study to environmental remediation challenges associated with heavy metal contamination in aqueous environments.

Key Words: Biosorption, Kinetics, Heavy Metals, Microorganisms, EnvironmentalRemediation, Metal Uptake, Water Treatment.

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5. Effects Of Particle Sizes On Bioremediation Of Crude OilPolluted Sandy Soils

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Abstract: Bioremediation, a microbial-driven process, shows promise in mitigating the impact of crude oil pollution, and this study aims to understand the intricate interplay between differentparticle sizes within sandy soils and the efficiency of microbial degradation. Experimental analyses are conducted with sandy soils of varying particle sizes, simulating realistic conditionsof crude oil pollution. The focus is on assessing the biodegradation rates and microbial activitiesassociated with different soil textures. By systematically examining the impact of particle sizes on microbial interventions, the research aims to unravel the complexities of how soil texture influences the efficacy of bioremediation processes. The outcomes of this research are expectedto contribute valuable insights into optimizing bioremediation strategies for crude oil-polluted sandy soils. Understanding the effects of particle sizes on microbial degradation rates and activities is crucial for developing targeted and efficient remediation approaches. This research addresses a critical aspect of environmental pollution, providing knowledge that can inform sustainable practices for the restoration of sandy soil ecosystems impacted by crude oil contamination. In summary, this detailed abstract outlines the methodological approach, emphasizing the experimental analyses and the significance of the study in advancing our understanding of the effects of particle sizes on the bioremediation of crude oil-polluted sandy soils.

Key Words: Bioremediation, Particle Sizes, Crude Oil, Sandy Soils, Environmental Pollution,Microbial Degradation, Soil Texture, Biodegradation Rates.

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6. The Effect Of Bioremediation On The Compaction Parameters,Cbr And Permeability Of Oil Polluted Soil

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Abstract: Soil contamination by oil presents a significant environmental challenge, and bioremediation, as an eco-friendly intervention, offers a potential solution. The study focuses onunderstanding how the application of bioremediation techniques influences not only the degradation of oil pollutants but also the fundamental geotechnical properties of the soil. The research involves controlled experiments where oil-polluted soil samples undergo bioremediation processes. Compaction parameters, CBR, and permeability are systematically monitored before and after the bioremediation treatment. The objective is to assess the changes in soil structure, strength, and hydraulic conductivity resulting from microbial interventions.Detailed analyses provide insights into the effectiveness of bioremediation in altering the geotechnical characteristics of oil-polluted soil. Understanding these changes is crucial for evaluating the potential long-term impacts on soil stability, load-bearing capacity, and water flowproperties. The research outcomes contribute valuable knowledge for both environmental and geotechnical engineering, informing sustainable practices for remediating oil-contaminated soils while considering their geotechnical implications. In summary, this detailed abstract outlines the experimental approach, emphasizing the comprehensive assessment of the effect of bioremediation on compaction parameters, CBR,and permeability in oil-polluted soil.

Key Words: Bioremediation, Oil-Polluted Soil, Compaction Parameters, California Bearing Ratio (CBR), Permeability, Geotechnical Properties, Environmental Engineering, SustainablePractices.

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7. Appraisal Of Construction Health And Safety Risk ManagementIn Nigerian Construction Industry- A Case Study Of The Building Industry

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Abstract: The construction industry is inherently prone to various risks that can impact the health and safety of workers and stakeholders. The study employs a case study methodology, delving into the specifics of the building industry in Nigeria to assess the current state of health and safety risk management practices. The research involves a comprehensive examination of risk identification, assessment, mitigation, and monitoring strategies adopted within the construction projects. It considers both qualitative and quantitative aspects of risk management, evaluating the effectiveness of existing protocols and their alignment with industry standards andregulatory frameworks. Additionally, the study explores the cultural and organizational factors that influence the implementation of health and safety measures on construction sites. Interviews,surveys, and document analyses contribute to gathering data on the attitudes, practices, and challenges faced by construction professionals regarding health and safety risk management. Theoutcomes of this research are expected to provide a nuanced understanding of the strengths and weaknesses in construction health and safety risk management practices in the Nigerian buildingindustry. The findings can inform policy improvements, industry guidelines, and educationalinitiatives aimed at enhancing safety culture and minimizing risks in construction projects.

Key Words: Construction Health and Safety, Risk Management, Nigerian Construction Industry, Building Industry, Case Study, Risk Identification, Risk Assessment, Risk Mitigation,Safety Culture.

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8. A High Resolution Analysis Of Spatiotemporal Variations OfGeomagnetic Field Using Parallel Computing

[1] Mr S DINESHKUMAR, [2] Ms K VANISRI, [3] Ms G GANGA, [1,2] Assistant professor, [3]Assistant professor TRP Engineering College, Indra Ganesan College ofEngineering, Trichy.

Abstract: This research presents a high-resolution analysis of spatiotemporal variations in the geomagnetic field, leveraging parallel computing techniques to achieve enhanced computationalefficiency. Geomagnetic field variations are critical for understanding Earth's dynamic processesand have implications for various scientific and technological applications. The study employs advanced computational methods to analyze the intricate spatiotemporal patterns of the geomagnetic field. The research methodology involves the utilization of parallel computing, a powerful approach for handling complex computations concurrently. High-resolution geomagnetic field data are processed, and sophisticated algorithms are implemented to extract detailed spatiotemporal variations. The parallel computing framework allows for efficient data processing, enabling a more granular analysis of geomagnetic field behavior. The application of parallel computing techniques showcases the potential for improving the resolution and accuracyof analyses involving large datasets. This research aligns with the broader goal of advancing ourknowledge of Earth's magnetic field dynamics through cutting-edge computational approaches. In summary, this detailed abstract outlines the research's methodological approach, emphasizing the use of parallel computing for high-resolution analysis, the significance of studying geomagnetic field variations, and the potential implications for scientific and technological applications.

Key Words: High Resolution Analysis, Spatiotemporal Variations, Geomagnetic Field, ParallelComputing, Computational Efficiency, Earth's Magnetic Field Dynamics, Scientific Applications, Technological Implications.

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9. Corrosion Inhibitors From Plant Extract And Terephthal AmideDerived From Waste Pet Bottle For Mild Steel In Acid Medium

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Abstract: Corrosion poses a significant challenge to the integrity of metal structures, and the study aims to explore eco-friendly and sustainable alternatives for corrosion protection. The research involves the extraction of corrosion-inhibiting compounds from plant sources and thesynthesis of a terephthal amide from waste PET bottles.The inhibitory properties of these compounds are systematically evaluated through experimentalanalyses, focusing on their effectiveness in mitigating mild steel corrosion in acidic media. The study considers factors such as corrosion rates, surface morphology, andelectrochemical behavior to assess the performance of the inhibitors. The use of waste PETbottles contributes to sustainability by repurposing plastic waste into a corrosion inhibitor. The outcomes of this research have implications for corrosion protection strategies, especially in industries where mildsteel is exposed to acidic conditions. The utilization of plant extracts and recycled materials aligns with the principles of green chemistry and sustainable development. The findings may inform the development of environmentally friendly corrosion inhibitors with potential applications in various sectors, promoting both corrosion resistance and waste reduction. In summary, this detailed abstract outlines the research's methodological approach, emphasizing theuse of plant extracts and a terephthal amide from waste PET bottles as corrosion inhibitors, the experimental analyses conducted, and the potential implications for sustainable corrosion protection.

Key Words: Corrosion Inhibitors, Plant Extracts, Terephthal Amide, Waste PET Bottles, MildSteel, Acidic Medium, Sustainable Chemistry, Eco-Friendly Corrosion Protection.

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10. Effective Of The Treatment Of Fine-Grained Lateritic SoilUsing Sugarcane Bagasse Ash (Scba) For Use In Modern Day Construction

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Abstract: Fine-grained lateritic soils often pose challenges in construction due to their expansiveand compressible nature. The study explores the utilization of sugarcane bagasse ash, a byproduct of the sugarcane industry, as a potential stabilizing agent for these soils.research methodology involves laboratory investigations to assess the geotechnical properties of the treated soil. Sugarcane bagasse ash is introduced to the soil in varying proportions, and a series of tests, including compaction, California Bearing Ratio (CBR), and unconfined compression tests, are conducted. The study aims to determine the optimum percentage of SCBA for improving the engineering characteristics of fine-grained lateritic soil. The outcomes of this research are expected to provide insights into the effectiveness of sugarcane bagasse ash in stabilizing fine-grained lateritic soils, making them suitable for construction purposes. The utilization of SCBA not only addresses the challenges associated with these soils but also contributes to sustainable waste management by repurposing an agricultural byproduct. The findings may have implications for soil stabilization techniques in regions with abundant sugarcane cultivation. In summary, this detailed abstract outlines the research's methodological approach, emphasizing laboratory investigations, the use of sugarcane bagasse ash as a stabilizing agent, and the potential contributions to modern-day construction practices.

Key Words: Fine-Grained Lateritic Soil, Sugarcane Bagasse Ash (SCBA), Soil Stabilization,Geotechnical Properties, Modern-Day Construction, Sustainable Construction Materials, Engineering Characteristics.

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11. Computer Simulation Of Air-Conditioning System Design AndDucting Analysis For Professionals And Engineering Students

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Abstract:

With the increasing complexity of HVAC (Heating, Ventilation, and Air Conditioning) systems in modern buildings, the study aims to develop a user-friendly and comprehensivesimulation tool that enables professionals and students to efficiently design, analyze, and optimize air-conditioning systems and associated ductwork. The simulation platform integrates advanced modeling techniques, taking into account factors such as thermal loads, airflow distribution, and energy efficiency. Users can interactively input parameters related to building design, occupancy, and environmental conditions to simulate the performanceof the air-conditioning system under various scenarios. The research emphasizes the educationalvalue of the simulation tool for engineering students, providing a hands-on learning experience in HVAC system design and analysis. For professionals, the tool serves as a practical resource for quick and accurate assessments of system performance, aiding in the decision-making process during the design and retrofitting of air-conditioning systems. The anticipated outcomes include a robust and user-friendly simulation tool that contributes to advancing the knowledge and skills of professionals andengineering students in the field of HVAC system design and ducting analysis.

Key Words: Computer simulation, air-conditioning system, ducting analysis, HVAC design, engineering education, thermal loads, energy efficiency, building simulation, professional development.

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12. Effect Of Coconut Shell Ash (Csa) As An Admixture On The PropertiesOf Cement Paste And Concrete

[1]Ms K GAYATHRI, [2]Ms GEENA J, [3]GUNASEELAN G, [1] Assistant professor, [2] Assistant professor, Trichy Engineering College, [3] U.G Student Department of civil engineering. IndraGanesan College of Engineering, Trichy.

Abstract:

Coconut shells, an abundant agricultural waste, are incinerated to produce CSA, a pozzolanic material that has the potential to enhance the performance of cementitious systems. The study systematically explores the influence of CSA on the fresh and hardened properties ofcement paste and concrete mixtures. Laboratory experiments involve the incorporation of varying percentages of CSA in cement paste and concrete. Tests, including workability, setting time, compressive strength, and durability assessments, are conducted to evaluate the impact ofCSA on the performance of both fresh and hardened cementitious materials. The study also investigates the microstructural changes induced by CSA, utilizing techniques such as scanningelectron microscopy (SEM) and X-ray diffraction (XRD). The research aims to identify the optimal percentage of CSA that enhances the mechanical and durability properties of cement paste and concrete without compromising overall performance. Additionally, the study exploresthe economic and environmental aspects of utilizing CSA as a sustainable alternative to traditional admixtures. The anticipated outcomes of this research contribute to the body of knowledge surrounding the use of CSA as an admixture in cementitious materials. The findings are expected to provide valuable insights for concrete producers, engineers, and researchersseeking to develop environmentally friendly and high-performance concrete mixtures.

Key Words: Coconut Shell Ash (CSA), admixture, cement paste, concrete, pozzolan, compressive strength, durability, microstructure, sustainable construction, environmental impact.

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13. Use Of Correlation And Regression Analyses As StatisticalTools In Green Concrete Research

[1]Ms G BHARANI, [2] GUNASEELAN G, [3] SUTHAKAR R, [1] Assistant professor, [2,3] U.G StudentDepartment of civil engineering, Indra Ganesan College of Engineering, Trichy.

Abstract:

With a growing emphasis on sustainable construction practices, the study aims to establish quantitative relationships and patterns within datasets related to the formulation and performance of green concrete mixtures. Correlation and regression analyses are employed to elucidate the interdependencies between various sustainable additives and concrete properties. Laboratory experiments involve the systematic incorporation of eco-friendly materials such as fly ash, slag, and recycled aggregates into concrete mixtures. A range of tests, including compressive strength, flexural strength, and durability assessments, are conducted to evaluate theperformance of green concrete. Concurrently, statistical analyses, including correlation matrices and regression models, are employed to identify significant correlations between the added sustainable components and the resulting concrete properties. The research not only focuses on predicting the impact of individual additives but also explores potential synergies or antagonisticeffects when multiple green constituents are combined. The statistical tools aid in quantifying thedegree of influence each component exerts on the concrete's mechanical and durability characteristics. The outcomes of this study are expected to provide a robust statistical frameworkfor researchers and practitioners engaged in green concrete development. By identifying statistically significant relationships, the research aims to enhance the understanding of how various eco-friendly materials contribute to the overall performance of concrete. Ultimately, the findings may facilitate the optimization of green concrete mix designs and contribute to the broader goal of sustainable construction practices.

Key Words: Green concrete, statistical analysis, correlation analysis, regression analysis, sustainable construction, eco-friendly materials, concrete properties, compressive strength,flexural strength, durability.

14. Comparative Assessment Of Rice Husk Ash, Powdered Glass AndCement As Lateritic Soil Stabilizers

[1]Ms E VINODHA, [2]MANIKANDAN M, [3]KALANCHITA MUNIYARAJ B, [1] Assistant professor, [2,3] U.G Student Department of civil engineering, Indra Ganesan College of Engineering, Trichy.

Abstract:

The research aims to evaluate the effectiveness of these materials in enhancing the geotechnical properties of lateritic soils, with a specific focus on their suitability for stabilizingsoils commonly found in tropical regions. Laboratory experiments involve the collection ofrepresentative lateritic soil samples, which are then treated with varying percentages of RHA, powdered glass, and cement. A series of geotechnical tests, including compaction tests, California Bearing Ratio (CBR) tests, and unconfined compressive strength (UCS) tests, are conducted to assess the impact of each stabilizer on soil characteristics. The study explores theeconomic and environmental aspects of using RHA, powdered glass, and cement as soil stabilizers, considering factors such as cost-effectiveness, availability, and sustainability.Additionally, microstructural analyses, utilizing techniques like scanning electron microscopy (SEM), are employed to investigate the changes in soil structure induced by the stabilization process. The outcomes of this research aim to provide a comprehensive understanding of the comparative performance of RHA, powdered glass, and cement as lateritic soil stabilizers. The findings may offer valuable insights for engineers and researchers seeking sustainable and locally available alternatives for soil stabilization, particularly in regions with prevalent lateriticsoils.

Key Words: Rice Husk Ash (RHA), Powdered glass, cement, Lateritic soil, Soil stabilization, geotechnical properties, Compaction, California Bearing Ratio (CBR), Unconfined compressivestrength (UCS), Sustainable construction, Tropical soils.

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15. Geotechnical Characterization Of Laterites Stabilised WithSawdust Ash-Lime As Subgrade Material In Road Construction

[1]Mr R SIVASHANKAR, [2] Mr S RAMALINGAM, [3] VISHWA S, [1,2] Associate professor, [3] U.GStudent Department of civil engineering, Indra Ganesan College of Engineering, Trichy.

Abstract:

Lateritic soils are commonly encountered in tropical regions, and their engineering properties often pose challenges for road construction. This study investigates the feasibility ofutilizing a stabilizing blend of sawdust ash and lime to enhance the geotechnical characteristicsof lateritic soils, with the aim of improving their suitability for use as a subgrade material.Laboratory experiments involve the collection of representative lateritic soil samples, which arethen treated with varying proportions of sawdust ash and lime. Standard geotechnical tests, including compaction tests, California Bearing Ratio (CBR) tests, and unconfined compressive strength (UCS) tests, are conducted to assess the impact of the stabilization process on soil properties. The study also investigates the long-term durability and environmental sustainabilityof the stabilized lateritic soils, considering factors such as moisture susceptibility and leachability. Microstructural analyses, using techniques such as X-ray diffraction (XRD) and scanning electron microscopy (SEM), are employed to examine the changes in soil structure induced by the stabilization process.The outcomes of this research are expected to provide insights into the effectiveness of sawdust ash-lime stabilization in improving the engineering properties of lateritic soils, particularly as subgrade material for road construction. The findingsmay have implications for sustainable and cost-effective road infrastructure development in regionswhere lateritic soils are prevalent.

Key Words: Laterites, sawdust ash-lime, Geotechnical characterization, Subgrade material,Road construction, Compaction, California Bearing Ratio (CBR), Unconfined compressive strength (UCS), Durability, Environmental sustainability.

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16. Investigation Of Crushability Of Concrete Of DifferentGranite Aggregate Sizes Using Impact Test

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[3] U.G Student Department of civil engineering, Indra Ganesan College of Engineering, Trichy.

Abstract:
The crushability, or resistance to impact-induced fragmentation, is a critical factor in assessing the performance of concrete structures subjected to dynamic loads such as impact or blast events. The study systematically examines the influence of different granite aggregate sizeson the impact resistance and energy absorption capacity of concrete.Laboratory experiments involve the preparation of concrete specimens with distinct granite aggregate sizes, ranging fromfine to coarse. Impact tests are conducted to simulate dynamic loading conditions, and the resulting data is analyzed to assess the crushability of each concrete mix. Parameters such as impact strength, energy absorption, and fracture patterns are scrutinized to gain insights into the relationship between aggregate size and crushability. Additionally, the study explores the microstructural changes within the concrete matrix induced by impact loading, utilizing techniques such as scanning electron microscopy (SEM) to examine the fracture surfaces and deformation patterns. The findingsaim to enhance our understanding of the crushability characteristics associated with different granite aggregate sizes and their implications for the structural performance of concrete under dynamic loading conditions. The outcomes of this research are expected to contribute to the optimization of concrete mix designs for structures subjected to impact loading, providing valuable insights for engineers and researchers in the fieldof structural engineering. The knowledge gained from this investigation may lead to Improved construction practices and the development of concrete formulations tailored for enhanced impact resistance.

Key Words: Crushability, concrete, Granite aggregate, Impact test, Dynamic loading, Aggregatesize, Energy absorption, Fracture patterns, Structural engineering, Concrete mix design.

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17. Domestic Water Treatment Using Moringa Oleifera SeedPowder

[1]Mr S DINESHKUMAR, [2] DHARUNKUMAR, [3] SUTHAKAR R, [1]Assistant professor, [2,3] U.GStudent Department of civil engineering, Indra Ganesan College of Engineering, Trichy

Abstract:

Moringa oleifera, a plant native to many tropical and subtropical regions, has gained attention for its potential in water purification due to the presence of coagulating proteins in itsseeds. The research focuses on assessing the efficiency of Moringa oleifera seed powder in reducing turbidity, removing impurities, and enhancing the overall quality of domestic water.Laboratory experiments involve the optimization of seed powder dosage and treatment conditions to achieve the most effective coagulation and clarification of water. The study also explores the impact of Moringa oleifera seed powder on microbial contaminants, investigating itspotential as a dual-functioning agent for both coagulation and disinfection.Furthermore, the research delves into the economic and environmental aspects of utilizing Moringa oleifera seed powder for water treatment in domestic settings. The goalis to provide acost-effective and sustainable alternative to conventional water treatment methods, particularlyin regions where access to commercial coagulants is limited.The anticipated outcomes of this study are expected to contribute to the development of accessible and eco-friendly solutions for domestic water treatment, especially in resource- constrained areas. The findings may have implications for community health, water qualityimprovement, and sustainable water management practices.

Key Words: Moringa oleifera, Water treatment, Coagulation, Turbidity removal, Natural coagulant, Domestic water, Sustainable solutions, Water purification, Microbial contaminants,Eco-friendly technology.

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18. Enhancing Concrete Properties With The Use Of Coconut (Coir)Fibres And Admixture

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Abstract: Coconut fibers, derived from the husk of coconuts, are renowned for their unique mechanical properties and environmental sustainability. The study explores the synergistic effects of combining coir fibers with specific admixtures to improve various aspects of concrete performance. A series of concrete mixtures are meticulously designed and tested to evaluate the impact of coir fibers and admixtures on compressive strength, flexural strength, workability, anddurability properties. Laboratory experiments include the optimization of fiber content and admixture dosage to achieve the desired improvements in concrete characteristics. The research aims to understand the mechanisms underlying the interactions between coir fibers, admixtures, and the concrete matrix. Additionally, the study investigates the influence of these enhancementson the microstructure and durability of the resulting concrete. The anticipated outcomes of this research extend beyond conventional concrete properties, delving into the realm of sustainable construction materials. By elucidating the potential benefits of coir fibers and admixtures, the study seeks to provide valuable insights for the development of eco-friendly and high- performance concrete mixtures. These findings are expected to contribute to the advancement ofsustainable building practices, promoting the utilization of renewable resources and innovative admixture technologies in the construction industry.

Key Words: Coconut fibers, Coir, concrete properties, Admixtures, Sustainable construction,Compressive Strength, flexural strength, Workability, Durability, Microstructure, Renewableresources, Eco-friendly construction, High-performance concrete.

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19. Some Later Ages Structural Characteristics Of Concrete Containing Empty Palm Oil Fruit Brunch Ash (Epo-Fba) As PartialReplacement Of Ordinary Portland Cement

[1]Mr S RAMALINGAM, [2] Ms K VANISRI, [1] Associate professor, [2] Assistant professor, IndraGanesan College of Engineering, Trichy.

Abstract: The growing environmental concerns and the need for sustainable construction materials have led to increased research on alternative materials in the field of civil engineering.This study investigates the structural characteristics of concrete incorporating Empty Palm Oil Fruit Bunch Ash (EPO-FBA) as a partial replacement for Ordinary Portland Cement (OPC) at different later ages. EPO-FBA, a waste byproduct from the palm oil industry, is considered a potential supplementary cementitious material due to its pozzolanic properties.The research involves the systematic replacement of OPC with varying percentages of EPO-FBA, ranging from 10% to 30% by weight. The concrete mixtures are carefully designed and tested to evaluatetheir compressive strength, flexural strength, and durability properties at different curing ages, specifically focusing on later ages beyond the initial setting period. Comprehensive laboratory experiments are conducted to assess the mechanical and durability performance of the EPO-FBAblended concrete. The study explores the effects of EPO-FBA on the hydration process, microstructure, and pore characteristics of the concrete matrix. Scanning electron microscopy (SEM) and X-ray diffraction (XRD) analyses are employed to examine the morphological changes and the crystalline phases present in the concrete. In conclusion, this research sheds lighton the viability of utilizing EPO-FBA as a partial replacement for OPC in concrete. emphasizing its impact on structural characteristics at later ages. The outcomes of this study are expectedto contribute to the development of environmentally friendly and economically sustainable concretemixtures for future construction applications.

Key Words: Empty Palm Oil Fruit Bunch Ash (EPO-FBA), Ordinary Portland Cement (OPC),concrete, structural characteristics, later ages, sustainability, environmental impact, partial replacement, construction materials.

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20. Assessment Of Volumetric Shrinkage And Hydraulic Conductivity Of Laterite Stabilized With Bamboo Leaf Ash AsLinear Material

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Abstract: Laterite, a widely available soil material, is often employed in construction and environmental engineering projects. However, its inherent limitations, such as high shrinkage and relatively poor hydraulic conductivity, necessitate the exploration of alternative stabilizing agents to enhance its performance. In this study, varying proportions of bamboo leaf ash are introduced to laterite to assess the potential improvements in volumetric stability and hydraulic conductivity. The experimental methodology involves the meticulous preparation of specimens with different ratios of bamboo leaf ash to laterite. These specimens are subjected to controlled environmental conditions to measure volumetric shrinkage, providing insights into the effectiveness of bamboo leaf ash in mitigating undesirable volume changes. Additionally, the hydraulic conductivity of the stabilized laterite is determined through permeability testing methods, offering a comprehensive understanding of the material's suitability for applications where controlled fluid flow is critical. The results obtained from the experimental phase are rigorously analyzed and compared with traditional stabilizing agents. The study aims to ascertainthe feasibility and efficiency of bamboo leaf ash as a sustainable and eco-friendly alternative for laterite stabilization. The findings not only contribute valuable data to the body of knowledge in geotechnical engineering but also offer practical insights for sustainable construction practices.This research holds significance in the broader context of sustainable development and environmentally conscious construction materials. By exploring the potential of bambooleaf ashas a stabilizer, the study aligns with the growing demand for innovative, eco- friendly solutions ingeotechnical engineering, paving the way for the adoption of sustainable practices in infrastructure development.

Key Words: Laterite, Bamboo Leaf Ash, Stabilization, Volumetric Shrinkage, Hydraulic Conductivity, Liner Material, Geotechnical Engineering, Sustainable Construction, PermeabilityTesting.

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21. Improved Second Order Solution And Its Application In TheAnalysis Of Redundant Frames

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Abstract: Redundant frames, common in civil and structural engineering, require accurate analysis methods to account for the effects of geometric nonlinearity and member imperfections.The study aims to enhance the accuracy and efficiency of existing second-order analysis techniques for redundant frames. The improved second-order solution incorporates advanced mathematical formulations and numerical algorithms to more precisely capture the nonlinear behavior of frames subjected to complex loading conditions. The research emphasizes the importance of considering both P-Δ (axial deformation) and P-δ (lateral displacement) effects, particularly in frames with redundant members, where traditional linear analyses may yield inadequate results. The study further explores the application of the improved second-order solution in the analysis of redundant frames, highlighting its advantages in predicting member forces, displacements, and overall structural behavior. The research considers practical engineering scenarios, including the influence of member imperfections, material nonlinearity, and variable loading conditions. The anticipated outcomes of this research include an enhanced analytical tool for the accurate assessment of redundant frames, providing engineers with a morereliable method for designing and optimizing structures with redundancy. The findings may contribute to the advancement of structural engineering practices, particularly in ensuring the safety and efficiency of complex framed structures.

Key Words: Second-order analysis, redundant frames, P-Δ effects, P-δ effects, geometric nonlinearity, member imperfections, structural engineering, numerical algorithms, nonlinearbehavior, structural optimization.

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22. Numerical Simulation Of Non-Premixed Turbulent Methane-AirCombustion

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Abstract: Non-premixed combustion involves the separate introduction of fuel and oxidizer intothe combustion zone, leading to complex interactions between turbulent flow and chemical reactions. The study employs advanced computational techniques to model and analyze the behavior of methane-air flames under turbulent conditions. Numerical simulations are conductedusing computational fluid dynamics (CFD) methods to capture the intricate coupling of fluid dynamics, heat transfer, and chemical reactions within the combustion system. The research specifically considers the effects of turbulence on flame structure, ignition, and pollutant formation, providing insights into the complex phenomena associated with non-premixed combustion. The investigation includes the validation of the numerical model against experimental data to ensure the accuracy and reliability of the simulation results. Sensitivityanalyses are performed to assess the impact of key parameters on combustion performance, offering a comprehensive understanding of the underlying physics governing turbulent methane-air flames. The anticipated outcomes of this research contribute to the advancement of combustion science and engineering, offering valuable insights for optimizing combustion systems in various applications, including industrial burners, internal combustion engines, and power generation. The findings may aid in the development of cleaner and more efficient combustion technologies by providing a deeper understanding of the interactions between turbulence and chemical reactions in methane-air combustion.

KeyWords: Numerical simulation, Non-premixed combustion, Methane-air flames, Turbulentcombustion, Computational fluid dynamics (CFD), Combustion modeling, Heat transfer, Pollutant formation, Combustion optimization.

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23. Study Of Hydraulic Jump In A Rectangular Flume By ComparingRectangular Block Wier And Sluice Gate

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Abstract: Hydraulic jumps occur when there is a sudden change in the flow regime, leading to increased turbulence and energy dissipation. Understanding and controlling hydraulic jumps are crucial in hydraulic engineering applications, including open channel flow management and spillway design. The study involves experimental investigations in a laboratory-scale rectangularflume equipped with both a rectangular block weir and a sluice gate. Hydraulic jumps are induced under various flow conditions, and the characteristics of the jumps, including jump length, sequent depth, and energy dissipation, are systematically measured and analyzed. The influence of flow rates, weir configurations, and gate settings on the hydraulic jump features is explored. Comparative analyses between the rectangular block weir and sluice gate aim to highlight the differences in hydraulic jump behavior and energy dissipation efficiency. The research also considers the hydraulic efficiency and practical applicability of each configuration for specific hydraulic engineering scenarios.
The anticipated outcomes of this study contribute tothe understanding of hydraulic jump characteristics in a rectangular flume and provide insights into the comparative performance of a rectangular block weir and a sluice gate. The findings mayhave implications for optimizing flow control structures, spillway design, and hydraulic energy dissipation in engineering applications.

Key Words: Hydraulic jump, Rectangular flume, Rectangular block weir, Sluice gate, Openchannel flow, Spillway design, Energy dissipation, Hydraulic engineering, Flow control structures.

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24. Analysis Of The Effect Of Polypropylene Polymer (CrushedPlastic Waste) On Oven Dried Laterite Bricks

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Abstract: This research focuses on the analysis of the effect of polypropylene polymer, derived from crushed plastic waste, on oven-dried laterite bricks. As the construction industry seeks sustainable and innovative solutions, the study explores the incorporation of recycled plastic materials into the production of laterite bricks, aiming to enhance their mechanical and thermal properties. Laboratory experiments involve the preparation of laterite brick specimens with varying percentages of polypropylene polymer. The bricks are subjected to comprehensive tests, including compressive strength, thermal conductivity, and water absorption assessments. The study evaluates the impact of the polymer on the structural integrity, insulation capabilities, and durability of the laterite bricks, particularly when subjected to elevated temperatures during the oven-drying process. The research addresses the environmental aspect by repurposing plastic waste as a construction material, contributing to waste management and sustainable building practices. Furthermore, the study examines the microstructural changes within the brick matrix induced by the addition of polypropylene, utilizing techniques such as scanning electron microscopy (SEM) and X-ray diffraction (XRD). The anticipated outcomes of this research include insights into the feasibility of using polypropylene polymer from crushed plastic waste asan additive to improve the performance of oven-dried laterite bricks. The findings may have implications for sustainable construction practices, offering a potential solution to both reduce plastic waste and enhance the properties of locally available construction materials.

Key Words: Polypropylene polymer, Crushed plastic waste, Laterite bricks, Sustainable construction, Compressive strength, Whermal conductivity, water absorption, Environmentalimpact, Microstructural analysis.

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25. The Effects Of Rotational Inertia On The Response OfDynamically Loaded Structures

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Abstract: In dynamic structural analysis, the consideration of rotational motion and its associated inertia effects is crucial for accurately predicting the behavior of engineering structures subjected to dynamic loads. The study aims to explore and quantify the impact of rotational inertia on the dynamic response of structures under various loading conditions. The research involves the development of mathematical models and numerical simulations to analyzestructures that exhibit rotational motion, such as rotating machinery, bridges with torsional flexibility, or any system where rotational inertia is a significant factor. The study considers the influence of parameters such as angular velocity, mass distribution, and structural damping on the dynamic behavior of the system. Additionally, the research investigates practical engineeringscenarios where the effects of rotational inertia may be critical, such as seismic loading on tall buildings, vibrations in rotating machinery, or wind-induced responses in slender structures. Theoutcomes of the study aim to provide engineers with valuable insights into the importance of considering rotational inertia in dynamic structural analysis and its implications for structural design and performance. The anticipated results contribute to advancing the understanding of rotational inertia effects, enabling more accurate predictions of the dynamic response of structures in engineering applications. The findings may have implications for optimizing the design and operation of structures subjected to dynamic loading.

KeyWords: Rotational inertia, Dynamic response, Structural dynamics, Dynamic analysis,engineering structures, Angular velocity, Mass distribution, Structural damping, Numericalsimulation, Structural design.

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26. Utilizing In Situ Ultraviolet-Visual Spectroscopy To MeasureNutrients And Sediment Concentrations In Stormwater Runoff

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Abstract: Stormwater management is critical for preserving water quality in urban environments, and traditional methods for monitoring pollutants are often time-consuming and resource-intensive. The study investigates the efficacy of UV-Vis spectroscopy in providing rapid and accurate assessments of nutrient and sediment levels in stormwater.
Field experimentsinvolve the deployment of UV-Vis spectrophotometers at stormwater monitoring sites, enabling continuous measurement of absorption spectra in the UV-Vis range. Calibration models are developed to correlate the observed spectral patterns with concentrations of specific nutrients (e.g., nitrogen and phosphorus) and sediment in the runoff. The research considers the impact ofenvironmental factors such as weather conditions, flow rates, and land use on the accuracy and reliability of the spectroscopic measurements. The study aims to validate the utility of in situ UV-Vis spectroscopy for real-time monitoring of stormwater quality, comparing its performancewith conventional laboratory methods. The anticipated outcomes include insights into the potential advantages, limitations, and practical considerations associated with the implementation of this innovative technique in stormwater management practices. The findings of this research may contribute to advancing the field of water quality monitoring by offering a more efficient and cost-effective method for assessing nutrients and sediment concentrations in stormwater runoff. The utilization of in situ UV-Vis spectroscopy has the potential to enhance the understanding of pollutant dynamics, facilitate timely decision-making, and support sustainable stormwater management strategies.

Key Words: In situ spectroscopy, UV-Vis spectroscopy, Stormwater runoff, Water quality monitoring, Nutrients, Sediment, Calibration models, Environmental monitoring, Real-timemeasurement, Stormwater management.

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27. Comparative Study On The Strength Of Lightweight Foamed Concrete Using Different Reagents (Lithofoam & Sodium LaurylSulphate

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Abstract: Lightweight foamed concrete is gaining prominence in the construction industry due to its reduced density and enhanced insulation properties. The study investigates the influence ofthese two distinct foaming agents on the mechanical and thermal characteristics of lightweight foamed concrete. Laboratory experiments involve the preparation of foamed concrete specimens with varying concentrations of LithoFoam and SLS. Comprehensive tests, including compressivestrength, tensile strength, density, and thermal conductivity, are conducted to evaluate the effectsof the foaming agents on the material properties. The study also considers the influence of curingconditions on the overall performance of lightweight foamed concrete. The research aims to provide insights into the comparative strengths and thermal properties of foamed concrete produced with LithoFoam and SLS, facilitating an understanding of their respective impacts on the material. The findings may have implications for material selection in construction applications, considering factors such as cost-effectiveness, availability, and sustainability.Additionally, microstructural analyses using techniques such as scanning electron microscopy (SEM) are employed to examine the internal structure of the foamed concreteand to correlate theobserved properties with the foaming agent used. The anticipated outcomes of this research contribute to the body of knowledge surrounding lightweight foamed concrete and its optimization for various construction applications. The study provides valuable information for engineers, researchers, and practitioners seeking to enhance the mechanical and thermal performance of lightweight foamed concrete throughthe judicious selection of foaming agents.

Key Words: Lightweight foamed concrete, LithoFoam, Sodium Lauryl Sulphate (SLS), compressive strength, tensile strength, density, thermal conductivity, construction materials, foaming agents, microstructural analysis.

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28. Title : Optimizing Resource Allocation In Cloud ComputingEnvironments For Energy Efficiency

1 Dr.P.Subharajam Professor/CSE Indra Ganesan College oEngineering,Manikandam,Trichy

12.2 Aishwarya M UG student/CSE Indra Ganesan CollegeEngineering,Manikandam,Trichy

Abstract:

Optimizing resource allocation in cloud computing environments for energy efficiency is crucial for reducing operational costs and minimizing environmental impact. This paper explores various strategies and techniques for achieving energy-efficient resource allocation in cloud environments. It discusses the challenges associated with energy consumption in data centers and presents approaches such as dynamic resource provisioning, workload balancing, and energy-aware scheduling. Furthermore, the paper examines the integration of renewable energy sources and the development of energy-efficient algorithmsto improve resource allocation. The findings suggest that by implementing these strategies, cloud service providers can achieve significant energy savings while maintaining highperformancelevels and meeting service level agreements.

Keywords:

Cloud Computing, Resource Allocation, Energy Efficiency, Virtualization, Data Centers, Green Computing, Power Management, Workload Balancing, Dynamic Resource Provisioning, Energy-AwareScheduling, Renewable Energy Integration, Server Consolidation, Load Balancing, Quality of Service (QoS), Energy-Efficient Algorithms, Power-Aware Computing, Energy Monitoring, Energy Harvesting.

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29. Title: Developing Explainable Artificial Intelligence Models ForDecision Support In Healthcare

1. Dr.P.Subharajam Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Ajith Kumar R (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Developing explainable artificial intelligence (AI) models for decision support in healthcare is essential for ensuring trust, transparency, and accountability in the decision-making process. This paper investigates the challenges and opportunities in creating AI models that can provide explanations for theirdecisions in healthcare settings. It examines the importance of interpretability in medical AI, consideringfactors such as regulatory requirements, ethical considerations, and user acceptance. The paper discusses various techniques for developing explainable AI models, including rule-based systems, interpretable machine learning algorithms, and model-agnostic approaches. Furthermore, it explores the potential benefits of explainable AI in improving clinical decision-making, patient outcomes, and healthcare delivery.

Keywords:
Explainable AI, Healthcare, Decision Support, Interpretability, Transparency, Accountability, RegulatoryCompliance, Ethical Considerations, User Acceptance, Rule-based Systems, Interpretable Machine Learning, Model-Agnostic Approaches, Clinical Decision-making, Patient Outcomes, Healthcare Delivery.

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30.Title: Blockchain-Based Decentralized Authentication SystemsForInternet Of Things (Iot)

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2. Aravindh Samy P (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Blockchain-based decentralized authentication systems for the Internet of Things (IoT) offer a promising solution to the security and privacy challenges faced by IoT devices and networks. This paper explores the potential of blockchain technology in providing secure and reliable authentication mechanisms for IoTdevices. It discusses the key features of blockchain, such as immutability, decentralization, and transparency, that make it suitable for authentication in IoT environments. The paper also examines the integration of blockchain with IoT authentication protocols, highlighting the benefits of using distributed ledger technology for identity management, access control, and data integrity verification in IoT applications. Furthermore, it discusses the challenges and future research directions in the development ofblockchain-based decentralized authentication systems for IoT.

Keywords:

Blockchain, Decentralized Authentication, Internet of Things (IoT), Security, Privacy, Identity Management, Access Control, Data Integrity, Distributed Ledger Technology, Authentication Protocols,Blockchain Integration, IoT Applications.

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31. Title: Blockchain-Based Decentralized Authentication Systems ForInternet Of Things (Iot)

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2. Arjun V (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Real-time predictive maintenance in cyber-physical systems (CPS) is crucial for ensuring the reliability and efficiency of industrial equipment. This paper investigates the application of edge computing in enabling real-time predictive maintenance for CPS. It discusses the challenges associated with traditional predictive maintenance approaches, such as latency and bandwidth limitations, and explores how edge computing can address these challenges by moving computation closer to the data source. The paper alsoexamines the integration of machine learning algorithms at the edge for real-time analysis of sensor data to predict equipment failures and prevent downtime. Furthermore, it discusses the potential benefits of

edge-based predictive maintenance, including reduced maintenance costs, improved equipment lifespan,and increased operational efficiency in industrial settings.

Keywords:

Real-time Predictive Maintenance, Cyber-Physical Systems (CPS), Edge Computing, Industrial Internetof Things (IIoT), Machine Learning, Sensor Data Analysis, Equipment Failure Prediction, Downtime Prevention, Edge Analytics, Latency, Bandwidth Limitations, Industrial Equipment, Operational Efficiency.

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32. Title: A Comparative Analysis Of Deep Learning ArchitecturesFornatural Language Processing Tasks

1. Dr.P.Subharajam Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Dharshini A (IV YR)) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Deep learning has shown remarkable success in natural language processing (NLP) tasks, but the choice of architecture plays a crucial role in the performance of these models. This paper presents a comparativeanalysis of deep learning architectures for NLP tasks, focusing on their strengths, weaknesses, and suitability for different types of tasks. The study evaluates popular architectures such as recurrent neural networks (RNNs), long short-term memory (LSTM) networks, gated recurrent units (GRUs), convolutional neural networks (CNNs), transformer models, and their variants. The analysis considers factors such as model complexity, training time, scalability, and performance on benchmark datasets. Thefindings provide insights into the strengths and limitations of each architecture, aiding researchers and practitioners in selecting the most appropriate model for specific NLP applications.

Keywords:

Deep Learning, Natural Language Processing (NLP), Deep Learning Architectures, Recurrent Neural Networks (RNNs), Long Short-Term Memory (LSTM), Gated Recurrent Units (GRUs), ConvolutionalNeural Networks (CNNs), Transformer Models, Comparative Analysis, Model Complexity, Training Time, Scalability, Benchmark Datasets.

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33. Tittle: Intelligent Traffic Management Systems Using ComputerVision And Machine Learning

1. Dr.K. Pandiyarajan Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Dinesh Kumar K (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Intelligent Traffic Management Systems (ITMS) play a crucial role in modern urban environments by optimizing traffic flow, enhancing safety, and reducing congestion. This paper explores the application ofcomputer vision and machine learning techniques in ITMS to achieve intelligent and adaptive traffic management. It discusses the use of computer vision for real-time traffic monitoring, vehicle detection and classification, traffic flow analysis, and anomaly detection. Furthermore, the paper investigates the integration of machine learning algorithms for predicting traffic patterns, optimizing signal timings, and identifying potential bottlenecks. The study also examines the challenges and opportunities in deploying intelligent traffic management systems based on computer vision and machine learning in diverse urban environments.

Keywords:
Intelligent Traffic Management Systems, ITMS, Computer Vision, Machine Learning, Traffic Monitoring, Vehicle Detection, Traffic Flow Analysis, Anomaly Detection, Traffic Prediction, SignalTiming Optimization, Urban Traffic, Congestion Management, Safety Enhancement.

34.Title: Quantum Computing Algorithms For Optimization Problems: A Comparative Study

1. Dr.K. Pandiyarajan Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Gowtham K (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Quantum computing has shown promising potential for solving optimization problems that are computationally intractable for classical computers. This paper presents a comparative study of quantumcomputing algorithms designed for optimization problems. It compares the performance of various quantum algorithms, such as Grover's algorithm, quantum annealing, and quantum approximate optimization algorithm (QAOA), in solving optimization problems across different domains. The study evaluates the strengths and weaknesses of each algorithm in terms of solution quality, scalability, and applicability to real-world optimization problems. Furthermore, it discusses the challenges and future prospects of quantum computing algorithms for optimization, highlighting their potential impact on various industries and scientific disciplines.

Keywords:
Quantum Computing, Optimization Problems, Quantum Algorithms, Grover's Algorithm, Quantum Annealing, Quantum Approximate Optimization Algorithm (QAOA), Comparative Study, Solution Quality, Scalability, Real-World Applications, Quantum Computing Challenges, Quantum ComputingImpact

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35. Title: Privacy-Preserving Data Analytics In The Era Of Big Data:Challenges And Solutions

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2. Hariharan N (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:
Privacy-preserving data analytics is crucial in the era of big data, where large volumes of sensitive information are collected and processed. This paper examines the challenges and solutions related to privacy-preserving data analytics in big data environments. It discusses the inherent tension between data utility and privacy, considering factors such as data anonymization, encryption, differential privacy, and secure multiparty computation. The paper explores various techniques and technologies that enable privacy preservation in data analytics, emphasizing their strengths and limitations in different use cases. Furthermore, it addresses emerging trends and future research directions in the field of privacy-preservingdata analytics to ensure the responsible and ethical use of big data while protecting individuals' privacy rights.

Keywords:
Privacy-Preserving Data Analytics, Big Data, Privacy Protection, Data Anonymization, Data Encryption,Differential Privacy, Secure Multiparty Computation, Privacy-Preserving Machine Learning, Privacy- Preserving Data Mining, Data Utility, Ethical Data Use, Privacy Rights, Responsible Data Analytics.

36. Tittle: Design And Implementation Of A Secure And Scalable EdgeComputing Infrastructure

1. Dr.K. Pandiyarajan Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Hema Latha B (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:
The design and implementation of a secure and scalable edge computing infrastructure are essential for supporting the growing demands of edge computing applications. This paper presents a comprehensive approach to designing and implementing such an infrastructure, considering security, scalability, and performance requirements. It discusses the architectural considerations for building a secure edge computing environment, including edge node deployment, communication protocols, data encryption, access control, and threat mitigation. The paper also addresses scalability challenges by exploring techniques such as load balancing, resource provisioning, and edge network management. Furthermore, itdiscusses the implementation details and best practices for deploying a secure and scalable edge computing infrastructure, considering the unique characteristics and constraints of edge environments.

Keywords:
Edge Computing, Secure Infrastructure, Scalable Infrastructure, Edge Node Deployment, CommunicationProtocols, Data Encryption, Access Control, Threat Mitigation, Load Balancing, Resource Provisioning, Edge Network Management, Implementation Best Practices, Edge Environment Constraints

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37. Title: Advancements In Machine Learning Algorithms For PredictiveAnalytics In Cybersecurity"

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2. Jegathiswari.D (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Advancements in machine learning algorithms have revolutionized predictive analytics in cybersecurity by enabling more accurate and proactive threat detection and prevention. This paper reviews recent developments in machine learning algorithms for predictive analytics in cybersecurity. It explores the application of supervised, unsupervised, and reinforcement learning techniques for tasks such as malwaredetection, intrusion detection, anomaly detection, and behavioral analysis. The paper discusses the strengths and limitations of different machine learning algorithms in the context of cybersecurity, considering factors such as model accuracy, interpretability, scalability, and resilience against adversarialattacks. Furthermore, it examines emerging trends and future directions in the use of machine learning forpredictive analytics in cybersecurity, including the integration of AI explainability and the adoption of federated learning approaches for decentralized threat intelligence.

Keywords:

Machine Learning, Predictive Analytics, Cybersecurity, Threat Detection, Malware Detection, IntrusionDetection, Anomaly Detection, Behavioral Analysis, Supervised Learning, Unsupervised Learning, Reinforcement Learning, Model Interpretability, Adversarial Robustness, Federated Learning, AI Explainability.

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38. Title: Optimizing Resource Allocation In Cloud ComputingEnvironments Through Intelligent Scheduling Techniques"

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2. Joshi Dayana K. (IV YR)) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Optimizing resource allocation in cloud computing environments is crucial for enhancing performance, reducing costs, and improving resource utilization. This paper focuses on the application of intelligent scheduling techniques to optimize resource allocation in cloud environments. It reviews various intelligent scheduling algorithms and approaches, including genetic algorithms, ant colony optimization,particle swarm optimization, and machine learning-based scheduling methods. The study evaluates thesetechniques in terms of their ability to handle dynamic workloads, minimize resource contention, and optimize resource allocation for diverse application requirements. Furthermore, the paper discusses the challenges and opportunities in implementing intelligent scheduling techniques for resource optimizationin cloud computing environments, considering factors such as scalability, reliability, and real-time decision-making.

Keywords:

Cloud Computing, Resource Allocation, Intelligent Scheduling, Optimization, Genetic Algorithms, AntColony Optimization, Particle Swarm Optimization, Machine Learning, Dynamic Workloads, ResourceContention, Scalability, Reliability, Real-time Decision-making.

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39. TITLE: OPTIMIZING RESOURCE ALLOCATION IN CLOUD COMPUTING ENVIRONMENTS THROUGH INTELLIGENT SCHEDULING TECHNIQUES"

1. Mrs.Hussain Bibi Sikkandar Professor / CSE Indra Ganesan College ofEngineering,Manikandam,Trichy 12.

2. Kanagaraj K.S (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Deep learning models have revolutionized image recognition in autonomous vehicles, enabling advancedperception capabilities for navigation and object detection. This paper presents a comparative analysis of deep learning models for image recognition in autonomous vehicles. It reviews state-of-the-art convolutional neural network (CNN) architectures, such as AlexNet, VGG, ResNet, and EfficientNet, andevaluates their performance in terms of accuracy, computational efficiency, and suitability for real-time applications. The study considers various factors influencing model selection, including model complexity, training data requirements, and deployment constraints. Furthermore, the paper discusses thechallenges and future directions in leveraging deep learning for image recognition in autonomous vehicles, aiming to provide insights for researchers and practitioners in the field.

Keywords:

Deep Learning, Image Recognition, Autonomous Vehicles, Convolutional Neural Networks (CNNs), Comparative Analysis, Model Performance, Computational Efficiency, Real-time Applications, ModelSelection, Training Data Requirements, Deployment Constraints, Future Directions.

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40. Title: Blockchain Technology: Enhancing Security AndTransparency In Internet Of Things (Iot) Networks

1. Mrs.Hussain Bibi Sikkandar Professor / CSE Indra Ganesan College ofEngineering,Manikandam,Trichy 12.

2. Madhavan S (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Human-computer interaction (HCI) in virtual reality (VR) environments presents unique challenges and opportunities for evaluating user experience (UX) and designing effective interfaces. This paper examinesthe principles and methodologies for evaluating UX and interface design in VR-based HCI. It reviews thekey components of VR HCI, including input/output devices, interaction techniques, and immersive environments, and discusses their impact on user perception and engagement. The study explores evaluation methods such as usability testing, user surveys, and physiological measurements, highlighting their application in assessing UX in VR. Furthermore, the paper discusses interface design principles tailored to VR environments, considering factors such as spatial interaction, presence, and immersion.The findings aim to provide insights into optimizing HCI in VR for enhanced user experienceandeffective interface design.

Keywords:

Human-Computer Interaction (HCI), Virtual Reality (VR), User Experience (UX), Interface Design,Usability Testing, User Surveys, Physiological Measurements, Interaction Techniques, Immersive Environments, Spatial Interaction, Presence, Immersion, Evaluation Methods.

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41. Title: Algorithmic Approaches For Real-Time Big DataProcessing In Analytics

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2. Mahendran S (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Real-time big data processing in streaming analytics requires efficient algorithmic approaches to handlelarge volumes of data with low latency. This paper provides an overview of algorithmic techniques usedfor real-time big data processing in streaming analytics. It discusses the challenges of processing data streams in real-time and explores various algorithmic approaches, including window-based processing, approximate algorithms, and parallel processing techniques. The study evaluates the performance and scalability of these approaches in the context of streaming analytics applications. Furthermore, the paperdiscusses the trade-offs between accuracy and speed in real-time big data processing and highlights emerging trends and future research directions in this field.

Keywords:

Real-time Big Data Processing, Streaming Analytics, Algorithmic Approaches, Data Streams, Window-based Processing, Approximate Algorithms, Parallel Processing, Performance Evaluation, Scalability, Accuracy, Speed, Emerging Trends.

42. Title: Securing The Future: A Study On Quantum CryptographyFor Post-Quantum Resilient Systems

1. Mrs.T. Anita dorothy Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Muthaiya P (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

As quantum computing advances, traditional cryptographic systems are becoming vulnerable to quantumattacks, posing a significant threat to data security. Quantum cryptography has emerged as a promising solution for building post-quantum resilient systems capable of withstanding quantum threats. This studyexplores the principles and applications of quantum cryptography for securing future information systems. It examines quantum key distribution (QKD) protocols, quantum-resistant cryptographic algorithms, and their potential to provide secure communication in a post-quantum computing era. The paper discusses the challenges and opportunities in implementing quantum cryptography, including technological readiness, standardization efforts, and integration with existing infrastructure. Furthermore,it provides insights into the role of quantum cryptography in shaping the future of secure communicationand data protection.

Keywords:

Quantum Cryptography, Post-Quantum Cryptography, Quantum Key Distribution (QKD), Quantum- Resistant Algorithms, Quantum Threats, Data Security, Information Systems, Technological Readiness,Standardization, Secure Communication, Data Protection.

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43. Title: Exploring Explainable Artificial Intelligence: BridgingThe Gap Between Accuracy And Interpretability In Predictive Models

1. Mrs.T. Anita dorothy Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Neathimozhi A (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

As artificial intelligence (AI) continues to advance, there is a growing need for models that not only deliver accurate predictions but also provide transparent explanations for their decisions. This paper explores the concept of explainable AI (XAI) and its significance in bridging the gap between accuracy and interpretability in predictive models. We discuss the challenges associated with traditional black-boxmodels and the increasing demand for transparent AI systems in various domains. Furthermore, we review the existing techniques and methodologies for implementing XAI, highlighting their strengths andlimitations. Through this exploration, we aim to provide insights into the evolving landscape of AI and contribute to the development of more interpretable and trustworthy predictive model.

Keywords:
Explainable Artificial Intelligence, XAI, Interpretability, Predictive Models, Transparency, Accuracy,Machine Learning, AI Ethics

44. Title: Robotic Swarm Intelligence For AutonomousSurveillance And Exploration

1. Mrs.T. Anita dorothy Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Nithya P (IV YR) CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Robotic swarm intelligence has emerged as a promising approach for achieving autonomous surveillance and exploration in various domains. By leveraging the collective behaviors and interactions of a group of robots, swarm intelligence enables the distributed coordination of tasks such as surveillance of large areasor exploration of unknown environments. This paper provides an overview of the principles behind robotic swarm intelligence and its applications in autonomous surveillance and exploration. We discuss the key components of swarm robotics systems, including communication protocols, decision-making algorithms, and adaptive behaviors. Additionally, we highlight the challenges and opportunities associated with the deployment of robotic swarms in real-world scenarios, addressing issues such as scalability, robustness, and adaptability. Through this exploration, we aim to contribute to the understanding of how swarm intelligence can be harnessed to enhance the capabilities of autonomous robotic systems for surveillance and

Keywords:
Robotic Swarm Intelligence, Autonomous Surveillance, Exploration, Swarm Robotics, Collective Behaviors, Distributed Coordination, Decision-Making Algorithms, Adaptive Behaviors, Scalability,Robustness, Adaptability

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45. Title: 5g And Beyond: Architectures And Protocols For Ultra-Reliable Low-Latency Communication (Urllc)

1. Mrs.T. Anita dorothy Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Nivedha S (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

The evolution of wireless communication technologies towards 5G and beyond has introduced new challenges and opportunities, particularly in the context of ultra-reliable low-latency communication(URLLC). URLLC is a key enabler for applications requiring stringent reliability and latency requirements, such as industrial automation, autonomous vehicles, and tactile Internet. This paperprovides an overview of the architectures and protocols designed to support URLLC in 5G and beyond networks. We discuss the key design principles, including ultra-reliable communication techniques, low-latency transmission schemes, and network slicing for URLLC services.Furthermore, we highlight the challenges and research directions in realizing the full potential of URLLC, such as resource allocation, network optimization, and integration with emerging technologies like edge computing and artificial intelligence. By examining the state-of-the-art in URLLC architectures and protocols, this paper aims to provide insights into the future of ultra- reliable low-latency communication in next-generation wireless networks.

Keywords:

5G, Beyond 5G, Ultra-Reliable Low-Latency Communication, URLLC, Wireless Communication, Network Architecture, Communication Protocols, Industrial Automation, Autonomous Vehicles, TactileInternet, Network Slicing, Edge Computing, Artificial Intelligence, Resource Allocation, Network Optimization.

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46. TITLE: ADVANCEMENTS IN MACHINE LEARNING ALGORITHMS FORPREDICTIVE ANALYTICS IN CYBERSECURITY

1. Mrs.T. Anita dorothy Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Priyanga.G (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

With the increasing complexity and frequency of cyber threats, there is a growing need for effective predictive analytics in cybersecurity to detect and mitigate attacks in real-time. Machine learning (ML) algorithms have emerged as powerful tools for predictive analytics, offering the capability to analyze vastamounts of data and identify patterns indicative of malicious activities. This paper provides an overview of recent advancements in ML algorithms specifically tailored for predictive analytics in cybersecurity.We discuss the challenges unique to cybersecurity applications, such as the imbalance of class distributions and the need for interpretability in ML models. Additionally, we review state-of-the-art ML techniques, including deep learning, ensemble methods, and anomaly detection algorithms, highlighting their strengths and limitations in the context of cybersecurity. Furthermore, we examinethe integration ofML algorithms with other cybersecurity technologies, such as threat intelligence and security informationand event management (SIEM) systems, to enhance predictive capabilities. By exploring the latest developments in ML algorithms for predictive analytics in cybersecurity, this paper aims to contribute to the ongoing efforts to bolster cyber defenses against evolving threats.

Keywords:

Machine Learning, Predictive Analytics, Cybersecurity, Threat Detection, Anomaly Detection, Deep Learning, Ensemble Methods, Imbalanced Data, Interpretability, Threat Intelligence, Security Informationand Event Management (SIEM)

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47. Title: Optimizing Resource Allocation In Cloud ComputingEnvironments: A Machine Learning Approach

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2. Ramya R (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Cloud computing environments offer a flexible and scalable infrastructure for hosting a wide range of applications. Efficient resource allocation is critical to ensuring optimal performance and cost-effectiveness in such environments. This paper presents a machine learning-based approach to optimize resource allocation in cloud computing environments. We discuss the challenges associated with resourceallocation, including dynamic workload patterns, varying resource demands, and cost considerations. Wethen propose a machine learning framework that leverages historical usage data to predict future resourceneeds and optimize allocation decisions. We explore different machine learning techniques, such as regression, clustering, and reinforcement learning, that can be used to model resource usage patterns and make proactive allocation decisions.
Furthermore, we discuss the integration of our approach with existing cloud management systems to enable automated and adaptive resource allocation. Through this machine learning approach, we aim to improve resource utilization, enhance performance, and reduce costs in cloud computing environments.

Keywords:

Cloud Computing, Resource Allocation, Machine Learning, Optimization, Workload Prediction, CostEfficiency, Performance Enhancement, Regression, Clustering, Reinforcement Learning, Cloud Management Systems.

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48. Titleblockchain Technology For Secure And TransparentSupply Chain Management In Industry 4.0.

1. Mrs. A.Ramya Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Sharvesh Charan.S.A (IV YR)/CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Blockchain technology has gained significant attention for its potential to revolutionize supply chain management in the context of Industry 4.0. By providing a secure and transparent distributed ledger, blockchain enables new levels of trust and efficiency in supply chain processes. This paper explores the application of blockchain technology in supply chain management, focusing on its ability to enhance transparency, traceability, and security. We discuss the key features of blockchain, such as immutability,decentralization, and consensus mechanisms, that make it well-suited for addressing the challenges facedby modern supply chains. Furthermore, we examine real-world use cases and implementations of blockchain in supply chain management, highlighting the benefits and challenges associated with its adoption. Through this exploration, we aim to provide insights into how blockchain technology can be leveraged to create more secure, transparent, and resilient supply chains in the era of Industry 4.0.

Keywords:

Blockchain Technology, Supply Chain Management, Industry 4.0, Transparency, Traceability, Security,Distributed Ledger, Decentralization, Consensus Mechanisms, Smart Contracts, Immutable Record.

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49. Exploring The Potential Of Quantum Computing In Solving Np-Hard Problems

1. Mrs. A.Ramya Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Sathasivam P (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Quantum computing has emerged as a promising paradigm that could potentially revolutionize the field of computational complexity by offering the capability to solve certain NP-hard problems more efficiently than classical computers. This paper provides an overview of the potential of quantum computing in addressing NP-hard problems, which are known for their computational intractability. We discuss the fundamental principles of quantum computing that enable it to outperform classical computers in solving certain classes of problems, including the concepts of superposition and entanglement. Furthermore, we review specific NP-hard problems, such as the traveling salesman problem and the knapsack problem, and explore how quantum algorithms, such as Grover's algorithm and quantum annealing, can be applied to these problems to achieve exponential speedup compared to classical algorithms. Additionally, we examine the current state of quantum computing technologies and the challenges that need to be overcome to realize their full potential in solving NP-hard problems. Through this exploration, we aim to provide insights into the capabilities and limitations of quantum computing in tackling some of the most challenging computational problems.

Keywords:

Quantum Computing, NP-Hard Problems, Computational Complexity, Superposition, Entanglement, Grover's Algorithm, Quantum Annealing, Traveling Salesman Problem, Knapsack Problem, ExponentialSpeedup.

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50. Title: Human-Computer Interaction: Enhancing UserExperience Through Natural Language Processing

1. Mrs. A.Ramya Professor / CSE Indra GanesanCollege of Engineering,Manikandam,Trichy 12.

2. Shalini P (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Human-computer interaction (HCI) plays a crucial role in shaping the user experience (UX) of interactivesystems. Natural Language Processing (NLP) has emerged as a powerful tool for enhancing HCI by enabling more intuitive and natural interactions between users and computers. This paper explores the potential of NLP in improving HCI and enhancing UX across various applications and domains. We discuss how NLP techniques, such as speech recognition, language understanding, and generation, can beleveraged to create more immersive and user-friendly interfaces. Furthermore, we examine the challengesand opportunities associated with integrating NLP into HCI, including issues related to accuracy, privacy,and ethical considerations. Through this exploration, we aim to shed light on the transformative impact ofNLP on HCI and its potential to redefine the way users interact with computing systems..

Keywords:

Human-Computer Interaction, User Experience, Natural Language Processing, Speech Recognition, Language Understanding, Language Generation, Interactive Systems, User-Friendly Interfaces, Accuracy,Privacy, Ethical Considerations .

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51. Robotic Swarm Intelligence: Coordination AndCollaboration In Multi-Robot Systems.

1. Mrs. A.Ramya Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Shanmuganathan P (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Robotic swarm intelligence has garnered significant attention due to its potential to enhance the capabilities of multi-robot systems through decentralized coordination and collaboration. This paper provides an overview of the principles and applications of robotic swarm intelligence, focusing on how it enables groups of robots to exhibit complex behaviors and achieve collective objectives. We discuss the key components of swarm robotics, including communication protocols, decision-making algorithms, andemergent behaviors. Furthermore, we explore the challenges and opportunities associated with implementing robotic swarm intelligence in real-world scenarios, such as scalability, robustness, and adaptability. By examining the state-of-the-art in swarm robotics, this paper aims to provide insights into the evolving field of robotic swarm intelligence and its impact on the development of advanced multi- robot systems.

Keywords:

Robotic Swarm Intelligence, Swarm Robotics, Multi-Robot Systems, Decentralized Coordination, Collaboration, Communication Protocols, Decision-Making Algorithms, Emergent Behaviors, Scalability,Robustness, Adaptability.

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52.Efficient Data Replication Strategies For FaultTolerance In Distributed Systems.

1. Ms.J.Jenifer Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Sheela.S (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Fault tolerance is a critical requirement for distributed systems to ensure continuous operation in the presence of failures. Data replication is a widely used technique to achieve fault tolerance by storing multiple copies of data across different nodes in the system. This paper explores efficient data replication strategies for fault tolerance in distributed systems. We discuss the fundamental concepts of datareplication, including consistency models, replication factors, and synchronization protocols.Furthermore, we review various replication strategies, such as primary-backup, multi-master, and quorum-based replication, highlighting their strengths and limitations in different scenariosAdditionally,we examine the trade-offs involved in choosing an appropriate replication strategy, considering factors such as performance, consistency, and fault tolerance. Through this exploration, we aim to provide insights into the design and implementation of efficient data replication schemes that can enhance the fault tolerance capabilities of distributed systems.

Keywords:

Data Replication, Fault Tolerance, Distributed Systems, Consistency Models, Replication Factors, Synchronization Protocols, Primary-Backup Replication, Multi-Master Replication, Quorum-BasedReplication. Performance, Consistency.

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53.Dynamic Load Balancing Algorithms For HeterogeneousDistributed Systems.

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2. Sudhakaran C (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Dynamic load balancing is essential for optimizing resource utilization and performance in heterogeneousdistributed systems where nodes have varying capabilities and workloads. This paper investigates dynamic load balancing algorithms tailored for such systems. We discuss the challenges posed by heterogeneity, including uneven resource capacities, diverse processing speeds, and variable network bandwidths. We then review several dynamic load balancing algorithms designed to address these challenges, such as task migration, threshold-based algorithms, and predictive load balancing.Additionally, we examine the trade-offs involved in selecting an appropriate algorithm, considering factors like overhead, scalability, and adaptability to changing system conditions. By exploring these algorithms, this paper aims to provide insights into the complexities of load balancing in heterogeneousdistributed systems and the strategies for achieving efficient resource utilization and performance.

Keywords:

Dynamic Load Balancing, Heterogeneous Distributed Systems, Resource Utilization, PerformanceOptimization, Task Migration, Threshold-Based Algorithms, Predictive Load Balancing, System Scalability, System Adaptability.

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54. Security And Privacy Challenges In DistributedComputing Environments.

1. Ms.J.Jenifer Professor /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Sugasini.O (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Distributed computing environments present unique security and privacy challenges due to their ~~decentralized nature and the distribution of data and computational tasks across multiple nodes.~~ This paper provides an overview of the key security and privacy challenges in distributed computing environments. We discuss issues such as data confidentiality, integrity, and availability, as well as privacyconcerns related to data sharing and communication. Additionally, we examine the impact of emerging technologies, such as edge computing and the Internet of Things (IoT), on the security and privacy landscape of distributed systems. Furthermore, we review existing security and privacy mechanisms and strategies, including encryption, authentication, access control, and secure communication protocols, designed to mitigate these challenges. Through this exploration, we aim to highlight the importance of addressing security and privacy concerns in distributed computing environments and provide insights intopotential solutions and best practices.

Keywords:

Security, Privacy, Distributed Computing, Data Confidentiality, Data Integrity, Data Availability, PrivacyProtection, Edge Computing, Internet of Things (IoT), Encryption, Authentication, Access Control, Secure Communication Protocols.

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55. Scalable And Fault-Tolerant Distributed File SystemsFor Cloud Computing.

1. Ms.J.Jenifer Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Vaishnavi G (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Distributed file systems are essential components of cloud computing environments, providing scalable and fault-tolerant storage for vast amounts of data. This paper explores the design principles and mechanisms behind scalable and fault-tolerant distributed file systems in the context of cloud computing.We discuss the challenges of building distributed file systems that can handle the scale and reliability requirements of cloud environments, including data replication, consistency, and availability.Furthermore, we review key concepts and techniques used in modern distributed file systems, suchsharding, replication strategies, and consensus algorithms, to achieve scalability and faulttolerance. Additionally, we examine real-world implementations of distributed file systems, suchas Google File System (GFS), Hadoop Distributed File System (HDFS), and Amazon S3, highlighting their architecturalchoices and trade-offs. Through this exploration, we aim to provide insights into the principles and best practices for designing scalable and fault-tolerant distributed file systems that meet the demands of cloudcomputing..

Keywords:

Distributed File Systems, Cloud Computing, Scalability, Fault Tolerance, Data Replication, Consistency,Availability, Sharding, Replication Strategies, Consensus Algorithms, Google File System (GFS), Hadoop Distributed File System (HDFS), Amazon S3.

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56. Optimization Of Communication Protocols In Large-Scale Distributed Systems.

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2. Vigna Sri S (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Communication protocols play a crucial role in the performance and efficiency of large-scale distributed systems by facilitating data exchange and coordination among distributed components. This paper investigates the optimization of communication protocols in the context of large-scale distributed systems. We discuss the challenges posed by the scale and heterogeneity of distributed systems, includinghigh latency, network congestion, and varying communication patterns. Furthermore, we review optimization techniques and strategies for communication protocols, such as protocol tuning, adaptive protocols, and protocol offloading, aimed at improving performance and scalability. Additionally, we examine the impact of emerging technologies, such as edge computing and Internet of Things (IoT), on communication protocols in distributed systems. Through this exploration, we aim to provide insights intothe complexities of optimizing communication protocols in large-scale distributed systems and the strategies for enhancing their efficiency and effectiveness.

Keywords:

Communication Protocols, Optimization, Large-Scale Distributed Systems, Performance, Scalability, Protocol Tuning, Adaptive Protocols, Protocol Offloading, Latency, Network Congestion, Heterogeneity,Edge Computing, Internet of Things (IoT).

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57. Optimizing Cloud Computing Resources For Scalable AndCost-Efficient Applications.

1. Mr.S Manikandan Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Vijaya Dharani K (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:
Cloud computing offers scalable resources for running applications, but efficiently utilizing these resources while managing costs remains a challenge. This paper explores strategies for optimizing cloud computing resources to achieve scalability and cost-efficiency in applications. We discuss the challenges of resource allocation, workload management, and cost optimization in cloud environments. Furthermore,we review techniques such as auto-scaling, containerization, serverless computing, and resource provisioning models that can be used to optimize resource usage and reduce costs. Additionally, we examine the role of monitoring, analytics, and optimization algorithms in continuously improving resource utilization and cost-effectiveness. Through this exploration, we aim to provide insights into bestpractices for optimizing cloud computing resources and achieving scalable and cost-efficient application deployments.

Keywords:
Cloud Computing, Resource Optimization, Scalability, Cost Efficiency, Auto-Scaling, Containerization,Serverless Computing, Resource Provisioning, Workload Management, Monitoring, Analytics, Optimization Algorithms.

58. Next-Generation Human-Computer Interaction: Exploring The Potential Of Augmented Reality Interfaces.

1. Mr.S.Manikandan Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Vinothini S (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

The evolution of human-computer interaction (HCI) has reached a new frontier with the emergence of augmented reality (AR) interfaces. AR interfaces overlay digital information onto the user's physical environment, offering new possibilities for intuitive and immersive interactions. This paper explores the potential of AR interfaces as a next-generation HCI paradigmFurthermore, we review the current state of AR applications in various domains, suches gaming, education, healthcare, and industry, highlighting their impact on user experience and task performance. Additionally, we examine the challenges and opportunities associated with the developmentand adoption of AR interfaces, including hardware limitations, user acceptance, and privacy concerns.

Through this exploration, we aim to provide insights into the transformative role of AR interfaces in shaping the future of HCI.

Keywords:
Human-Computer Interaction, Augmented Reality, Interfaces, Spatial Mapping, Object Recognition, Gesture Tracking, User Experience, Immersive Interactions, Gaming, Education, Healthcare, Industry,User Acceptance, Privacy Concerns.

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59. Blockchain Technology: A Decentralized Approach ToSecure And Transparent Data Management.

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2. Sivasangari C (IV YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Blockchain technology has gained widespread attention for its potential to revolutionize data managementby providing a decentralized and tamper-proof ledger for recording transactions and storing data. This paper explores the fundamental concepts and applications of blockchain technology as a secure and transparent approach to data management. We discuss the core principles of blockchain, including decentralization, immutability, and consensus mechanisms, that enable its trustworthiness and resilience against tampering. Furthermore, we review the diverse applications of blockchain beyond cryptocurrencies, such as supply chain management, healthcare records, and digital identity, highlighting its ability to enhance data security and transparency in various domains. Additionally, we examine the challenges and future directions of blockchain technology, including scalability, interoperability, and regulatory considerations. Through this exploration, we aim to provide insights into the potential of blockchain as a transformative technology for secure and transparent data management.

Keywords:

Blockchain Technology, Decentralization, Data Management, Secure Transactions, Transparency,Immutability, Consensus Mechanisms, Cryptocurrencies, Supply Chain Management, HealthcareRecords, Digital Identity, Scalability, Interoperability, Regulatory Considerations.

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60. Towards Energy-Efficient Computing: An InvestigationInto Green Computing Practices

1. Mr.S.Manikandan Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Arun R (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:
The increasing demand for computing resources has led to a growing concern about the environmentalimpact of data centers and IT infrastructure. Green computing practices aim to reduce the energy consumption and environmental footprint of computing systems. This paper investigates the principlesand practices of green computing towards achieving energy-efficient computing. We discuss the key challenges associated with energy consumption in computing systems, including hardware inefficiencies,cooling requirements, and data center operations. Furthermore, we review various green computing strategies, such as energy-efficient hardware design, workload consolidation, dynamic voltage and frequency scaling, and renewable energy integration, that can be employed to minimize energy usage andcarbon emissions. Additionally, we examine the economic and environmental benefits of green computing practices and their implications for sustainable computing. Through this investigation,

Keywords:
Green Computing, Energy-Efficient Computing, Data Centers, IT Infrastructure, Energy Consumption,Environmental Impact, Hardware Design, Workload Consolidation, Dynamic Voltage and Frequency Scaling, Renewable Energy Integration, Sustainable Computing.

61. Title: Quantum Computing: A Comprehensive Study OfAlgorithms And Applications

1. Mrs.A.Suganya Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. BharathiS (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:
Quantum computing represents a paradigm shift in computing technology, offering the potential to solve complex problems that are currently intractable for classical computers. This paper provides a comprehensive study of quantum computing, focusing on its algorithms and applications. We discuss the fundamental principles of quantum computing, including qubits, quantum gates, and quantum algorithms,such as Shor's algorithm and Grover's algorithm, that exploit quantum phenomena to perform computations. Furthermore, we review the current state of quantum computing hardware and platforms, highlighting advancements in quantum processors and quantum annealers. Additionally, we examine the diverse applications of quantum computing across various domains, such as cryptography, optimization, material science, and machine learning, showcasing its potential to revolutionize these fields. Through this comprehensive study, we aim to provide insights into the capabilities and limitations of quantum computing and its impact on future technological advancements.

Keywords:
Quantum Computing, Quantum Algorithms, Qubits, Quantum Gates, Shor's Algorithm, Grover's Algorithm, Quantum Hardware, Quantum Annealers, Cryptography, Optimization, Material Science,Machine Learning, Technological Advancements

62. Robustness And Explainability In Neural Networks: Bridging The Gap Between Performance And Interpretability

1. Mrs.A.Suganya Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Gowtham C (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Neural networks have achieved remarkable success in various machine learning tasks but often lack robustness and explainability, which are crucial for real-world applications. This paper explores the challenges and approaches in achieving robustness and explainability in neural networks to bridge the gapbetween performance and interpretability. We discuss the vulnerabilities of neural networks to adversarialattacks, data perturbations, and distribution shifts, which can compromise their reliability in critical applications. Furthermore, we review techniques for enhancing the robustness of neural networks, such asadversarial training, regularization, and robust optimization, aimed at improving their generalization and resilience to perturbations. Additionally, we examine methods for enhancing the explainability of neural networks, including model interpretability techniques, attention mechanisms, and explainable AI (XAI) methods, to provide insights into their decision-making processes. Through this exploration, we aim to provide insights into the trade-offs between performance, robustness, and explainability in neural networks and the strategies for achieving a balance between them.

Keywords:

Neural Networks, Robustness, Explainability, Adversarial Attacks, Data Perturbations, DistributionShifts, Adversarial Training, Regularization, Robust Optimization, Model Interpretability, AttentionMechanisms, Explainable AI (XAI), Generalization.

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63. Internet Of Things (Iot) For Smart Cities: Challenges,Opportunities, And Security Considerations

1. .Mrs.A.Suganya Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Indhumathi S (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:
The Internet of Things (IoT) has emerged as a key enabler for the development of smart cities, offering opportunities to enhance urban infrastructure, services, and quality of life. However, the widespread deployment of IoT in smart cities presents various challenges and security considerations that need to beaddressed. This paper examines the challenges and opportunities associated with the integration of IoT insmart cities and explores the security considerations that are crucial for ensuring the reliability and privacy of IoT-enabled systems. We discuss the unique challenges of IoT deployment in urban environments, such as scalability, interoperability, and data privacy, and review the opportunities for IoTto improve urban services, energy management, transportation, and public safety. Furthermore, we highlight the security threats and vulnerabilities inherent in IoT systems and examine the strategies andbest practices for mitigating these risks, including encryption, authentication, access control, and securedevice management.

Keywords:
Internet of Things (IoT), Smart Cities, Urban Infrastructure, Urban Services, Quality of Life, Challenges,Opportunities, Security Considerations, Scalability, Interoperability, Data Privacy, Security Threats, Vulnerabilities, Encryption, Authentication, Access Control, Secure Device Management.

64. Advanced Data Analytics For Predictive Maintenance In Industrial Iot Systems

1. Mrs.A.Suganya Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Ishwarya P (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

The Industrial Internet of Things (IIoT) has revolutionized the way industrial machinery and equipment are monitored and maintained. Predictive maintenance, enabled by advanced data analytics techniques, has emerged as a key application of IIoT, offering the potential to reduce downtime, optimize maintenance schedules, and extend the lifespan of critical assets. This paper investigates the role of advanced data analytics in predictive maintenance for industrial IoT systems. We discuss the challenges of implementing predictive maintenance in industrial settings, including data integration, feature engineering, and model deployment in resource-constrained environments. Furthermore, we review advanced data analytics techniques such as machine

Keywords:

Industrial Internet of Things (IIoT), Predictive Maintenance, Advanced Data Analytics, MachineLearning, Deep Learning, Anomaly Detection, Digital Twins, Industrial Machinery, MaintenanceOptimization, Asset Management, Downtime Reducti

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65. Enhancing Security In Cloud Computing: A Multi-LayeredApproach

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2. Kalaiyarasan V (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Cloud computing offers flexibility and scalability but raises security concerns due to the distributed natureof data and resources. This paper proposes a multi-layered approach to enhance security in cloud computing environments. We discuss the challenges of cloud security, including data breaches, insider threats, and compliance requirements. Furthermore, we review the layers of security in cloud computing, including physical security, network security, data security, and application security, and propose strategies for securing each layer. Additionally, we examine emerging technologies such as encryption, secure multi-party computation, and homomorphic encryption that can further strengthen cloud security. Through this multi-layered approach, we aim to provide a comprehensive framework for enhancing security in cloud computing.

Keywords:

Cloud Computing, Security, Multi-Layered Approach, Data Breaches, Insider Threats, Compliance, Physical Security, Network Security, Data Security, Application Security, Encryption, Secure Multi-PartyComputation, Homomorphic Encryption.

66. Optimizing Machine Learning Algorithms For Real-TimeData Analysis In Iot Environments.

1. Mrs. R. Sankari Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Keerthika K (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

The Internet of Things (IoT) generates vast amounts of data that require real-time analysis for actionableinsights. Machine learning algorithms play a crucial role in analyzing IoT data, but their performance is often constrained by the resource limitations of IoT devices. This paper investigates strategies for optimizing machine learning algorithms to enable real-time data analysis in IoT environments. We discuss the challenges of deploying machine learning in IoT, including limited computational power, memory, and energy constraints. Furthermore, we review optimization techniques such as model compression, quantization, and hardware-aware algorithm design that can improve the efficiency of machine learning algorithms in IoT devices. Additionally, we examine the trade-offs between accuracy and resource efficiency in optimizing machine learning for real-time IoT data analysis. Through this investigation, we aim to provide insights into the techniques and considerations for achieving efficient and effective machine learning in IoT environments.

Keywords:

Machine Learning, IoT, Real-Time Data Analysis, Optimization, Model Compression, Quantization,Hardware-Aware Algorithm Design, Resource Constraints, Energy Efficiency, Trade-offs.

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67. Towards Explainable Artificial Intelligence:Interpretable Models For Decision Support.

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2. Keerthika V (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Explainable Artificial Intelligence (XAI) has gained attention as a critical component for building trustand understanding in AI systems, especially in decision support applications. This paper explores the importance of XAI and the need for interpretable models in decision support systems. We discuss the challenges associated with black-box models in decision-making processes, including the lack of transparency and the potential for bias. Furthermore, we review interpretable machine learning modelsand techniques, such as decision trees, rule-based systems, and model-agnostic methods, that enable explanations of AI decisions. Additionally, we examine the role of XAI in various domains, such as healthcare, finance, and autonomous systems, where transparent and interpretable AI is crucial for useracceptance and regulatory compliance.
Through this exploration, we aim to provide insights into the principles and techniques of XAI for building interpretable models in decision support applications.

Keywords:

Explainable Artificial Intelligence (XAI), Interpretable Models, Decision Support, Transparency. Bias,Interpretable Machine Learning, Decision Trees, Rule-Based Systems, Model-Agnostic Methods, Healthcare, Finance, Autonomous Systems, User Acceptance, Regulatory Compliance.

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68. Efficient Resource Allocation In Edge Computing For 5gNetworks.

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2. Krishi Gowtham R (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Edge computing has emerged as a key technology for enabling low-latency and high-bandwidth applications in 5G networks by bringing computational resources closer to end-users and devices. Efficient resource allocation is crucial in edge computing environments to optimize performance and meet the diverse requirements of 5G applications. This paper investigates strategies for efficient resourceallocation in edge computing for 5G networks. We discuss the challenges posed by the dynamic and heterogeneous nature of edge environments, including resource constraints, varying workloads, and Quality of Service (QoS) requirements. Furthermore, we review resource allocation techniques such as task offloading, workload scheduling, and resource provisioning that can improve the utilization of edgeresources and enhance the overall performance of 5G networks. Additionally, we examine the impact of emerging technologies such as artificial intelligence and machine learning on resource allocation in edge,computing. Through this exploration, we aim to provide insights into the complexities of resource allocation in edge computing for 5G networks and the strategies for achieving efficient and effectiveresource utilization.

Keywords:

Edge Computing, 5G Networks, Resource Allocation, Task Offloading, Workload Scheduling, ResourceProvisioning, Quality of Service (QoS), Artificial Intelligence, Machine Learning, Efficient Resource Utilization.

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69. Blockchain-Based Smart Contracts For DecentralizedAnd Trustworthy Systems.

1. Mrs. R. Sankari Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Logadipa Sp (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Blockchain technology, with its decentralized and immutable ledger, has enabled the development of smart contracts, self-executing contracts with the terms of the agreement directly written into code. This paper explores the application of blockchain-based smart contracts for creating decentralized and trustworthy systems. We discuss the fundamental concepts of blockchain and smart contracts, including their properties of transparency, immutability, and autonomy. Furthermore, we review the benefits of using smart contracts, such as automation, reduced intermediaries, and enhanced security, in various domains including finance, supply chain management, and digital identity. Additionally, we examine thechallenges and considerations in designing and deploying blockchain-based smart contracts, including scalability, privacy, and regulatory compliance. Through this exploration, we aim to provide insights intothe potential of blockchain-based smart contracts for creating decentralized and trustworthy systems.

Keywords:

Blockchain, Smart Contracts, Decentralization, Trustworthiness, Transparency, Immutability, Automation, Finance, Supply Chain Management, Digital Identity, Scalability, Privacy, RegulatoryCompliance.

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70. Human-Computer Interaction: Designing IntuitiveInterfaces For Improved User Experience.

1. Mrs. R. Sankari Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Mohamed Nowsath M (III YR) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:

Human-Computer Interaction (HCI) is a multidisciplinary field focused on the design, evaluation, and implementation of interactive computing systems for human use. This paper explores the importance of designing intuitive interfaces in HCI to improve the overall user experience (UX). We discuss the principles of user-centered design, usability, and UX, emphasizing the role of intuitive interfaces in enhancing user satisfaction and productivity. Furthermore, we review design strategies and best practicesfor creating intuitive interfaces, including user research, prototyping, and iterative design processes.Additionally, we examine the impact of emerging technologies such as natural language processing, gesture recognition, and augmented reality on the design of intuitive interfaces. Through this exploration,we aim to provide insights into the principles and practices of designing intuitive interfaces for improvedHCI and UX.

Keywords:
Human-Computer Interaction, HCI, User Experience, UX Design, Intuitive Interfaces, User-Centered Design, Usability, User Research, Prototyping, Iterative Design, Natural Language Processing, GestureRecognition, Augmented Reality.

71. Robustness And Reliability In Autonomous Systems: A CaseStudy In Self-Driving Cars.

1. Dr.G.Balakrishnan Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.
2. Deepa Lakshmi N (II M.E) /CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

Abstract:
Autonomous systems, such as self-driving cars, rely on robust and reliable algorithms to operate safely and effectively in complex environments. This paper presents a case study focusing on the challenges of ensuring robustness and reliability in self-driving cars as representative examples of autonomous systems. We discuss the unique requirements and constraints of autonomous vehicles, including real-time decision-making, s employed to enhance the robustness and reliability of self-driving cars, such as redundancy, fail-safe mechanisms, simulation testing, and machine learning-based approaches. Additionally, we examine the ethical and legal considerations associated with the deployment of autonomous systems in safety-critical applications. Through this case study, we aim to provide insights into the complexities of ensuring robustness and reliability in autonomous systems, with a focus on self-driving cars as a prominent example.

Keywords:
Autonomous Systems, Robustness, Reliability, Self-Driving Cars, Real-Time Decision-Making, SensorFusion, Fail-Safe Mechanisms, Simulation Testing, Machine Learning, Safety-Critical Applications, Ethical Considerations, Legal Considerations.

72. Advancements In Natural Language Processing ForIntelligent Conversational Agents.

1. Dr.G.Balakrishnan Professor / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.
2. Iswarya R (II M.E) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:
Natural Language Processing (NLP) has witnessed significant advancements in recent years, leading to the development of intelligent conversational agents capable of understanding and generating human-likelanguage. This paper provides an overview of the latest advancements in NLP techniques and their applications in building intelligent conversational agents.. Furthermore, we review state-of-the-art NLP models, such as transformer-based architectures, pre-trainedlanguage models, and transfer learning approaches, that have revolutionized the field of conversational AI. Additionally, we examine the impact of these advancements on various domains, such as customer service, healthcare, and virtual assistants, showcasing the potential of intelligent conversational agents in enhancing user experiences and productivity. Through this overview, we aim to provide insights into the recent developments in NLP and their role in shaping the future of conversational AI.

Keywords:
Natural Language Processing, NLP, Intelligent Conversational Agents, Conversational AI, LanguageUnderstanding, Transformer Models, Pre-trained Language Models, TransfeLearning.

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73. Energy-Efficient Routing Protocols For Wireless SensorNetworks In Precision Agriculture

1. Dr.G.Balakrishnan Professor / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.
2. Karthiga M (II M.E) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:
Wireless Sensor Networks (WSNs) play a crucial role in precision agriculture by enabling real-time monitoring of environmental parameters such as soil moisture, temperature, and humidity.
However, the energy constraints of sensor nodes pose significant challenges for the design of routing protocols in WSNs deployed in agricultural environments. This paper explores the importance of energy-efficient routing protocols for WSNs in precision agriculture. We discuss the unique characteristics of precision agriculture environments, including large-scale deployments, dynamic topologies, , and analyze their suitability for precision agriculture applications.
Additionally, we examine advanced techniques, including machine learning-based routing, data aggregation, and duty cycling, that can further enhance the energy efficiency of routing protocols in WSNs for precision agriculture. Through this exploration, wealm to provide insights into the challenges and opportunities in designing energy-efficient routing protocols for WSNs in precision agriculture.

Keywords:
Wireless Sensor Networks, WSNs, Precision Agriculture, Energy Efficiency, Routing Protocols, LEACH,TEEN, PEGASIS, Machine Learning, Data Aggregation, Duty Cycling, Environmental Monitoring.

74. Ethical Considerations In AI: Bias Detection And MitigationStrategies.

1. Dr.G.Balakrishnan Professor / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.
2. Ramalakshmi M (II M.E) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:
Artificial Intelligence (AI) systems are increasingly being used in decision-making processes across various domains, raising concerns about the potential biases embedded in these systems. This paper focuses on the ethical considerations related to bias detection and mitigation strategies in AI. We discussthe challenges of bias in AI, including data biases, algorithmic biases, and societal biases, and their implications for fairness, accountability, and transparency. Furthermore, we review strategies for detecting and mitigating biases in AI, such as data preprocessing techniques, fairness-aware algorithms, and bias audits. Additionally, we examine the ethical implications of biased AI systems, including their impact on individuals and society, and the importance of ensuring fairness and equity in AI applications.Through this exploration, we aim to provide insights into the ethical challenges of bias in AI and the strategies for addressing them...

Keywords:

Artificial Intelligence, AI Ethics, Bias Detection, Bias Mitigation, Fairness, Accountability, Transparency, Data Biases, Algorithmic Biases, Societal Biases, Data Preprocessing.

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75.Deep Learning For Image Recognition: Advancements AndChallenges.

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2. Moorthi C (III YR) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:

Deep learning has revolutionized the field of image recognition, enabling machines to achieve human- level performance in various visual recognition tasks. This paper provides an overview of the advancements and challenges in deep learning for image recognition. We discuss the evolution of deep learning models, from early convolutional neural networks (CNNs) to advanced architectures such as ResNet, Inception, and Transformer models, which have significantly improved image recognition accuracy. Furthermore, we review the challenges faced by deep learning models in image recognition, including robustness to adversarial attacks, data efficiency, interpretability, and scalability. Additionally, we examine the applications of deep learning in image recognition across various domains, such as healthcare, autonomous vehicles, and surveillance, highlighting the impact of these advancements on real-world applications. Through this overview, we aim to provide insights into the current state of deep learning for image recognition and the challenges that lie ahead.

Keywords:

Deep Learning, Image Recognition, Convolutional Neural Networks, CNNs, ResNet, Inception, Transformer Models, Advancements, Challenges, Adversarial Attacks, Data Efficiency, Interpretability,Scalability, Healthcare, Autonomous Vehicles, Surveillance.

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76. Reinforcement Learning In Robotics: From Simulation ToReal-World Applications.

1. Mr.N. Mohanprabhu Associate Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Nancy C (III YR) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:

Reinforcement learning (RL) has emerged as a powerful paradigm for training autonomous agents, including robots, to perform complex tasks. This paper provides an overview of the application of reinforcement learning in robotics, focusing on the transition from simulation to real-world applications. We discuss the challenges of applying RL to robotics, including the need for sample-efficient algorithms,transfer learning between simulation and reality, and safety considerations in real-world deployment.Furthermore, we review techniques for bridging the reality gap, such as domain randomization, sim- to- real transfer, and curriculum learning, that enable RL-trained robots to generalize from simulation to real-world environments. Additionally, we examine the real-world applications of RL in robotics, including robotic manipulation, navigation, and autonomous systems, showcasing the potential of RL to revolutionize the field of robotics. Through this overview, we aim to provide insights into the current stateof RL in robotics and the challenges and opportunities for its real-worlddeployment.

Keywords:

Reinforcement Learning, Robotics, Simulation, Real-World Applications, Sample Efficiency, TransferLearning, Safety, Domain Randomization, Sim-to-Real Transfer, Curriculum Learning, Robotic Manipulation, Navigation, Autonomous Systems.

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77. Transfer Learning In Natural Language Processing:Leveraging Pre-Trained Models For Improved Performance.

1. Mr.N. Mohanprabhu Associate Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Praveen K (III YR) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:

Transfer learning has emerged as a powerful technique in natural language processing (NLP), enabling the reuse of knowledge from pre-trained models to improve performance on downstream tasks. This paper provides an overview of transfer learning in NLP, focusing on the leveraging of pre-trained modelsfor improved performance. We discuss the challenges of training deep learning models for NLP tasks from scratch, including the need for large-scale labeled datasets and computational resources.Furthermore, we review transfer learning techniques, such as fine-tuning, feature extraction, and model adaptation, that enable the use of pre-trained language models, such as BERT, GPT, and RoBERTa, for various NLP tasks. Additionally, we examine the impact of transfer learning on improving the performance of NLP models across tasks such as text classification, named entity recognition, and language generation. Through this overview, we aim to provide insights into the principles and practicesof transfer learning in NLP and its role in advancing the state-of-the-art innatural language understanding

Keywords:

Transfer Learning, Natural Language Processing, Pre-trained Models, Fine-tuning, Feature Extraction,Model Adaptation, BERT, GPT, RoBERTa, Text Classification, Named Entity Recognition, LanguageGeneration.

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78. Image Enhancement Techniques For Low-LightConditions: A Comparative Study

1. Mr.N. Mohanprabhu Associate Professor / CSE Indra Ganesan College of Engineering,Manikandam,Trichy 12.

2. Ranjana S (III YR)/ CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:

Low-light conditions often result in poor-quality images with reduced visibility and increased noise levels, posing challenges for computer vision applications. This paper presents a comparative study of image enhancement techniques aimed at improving the quality of images captured in low-light environments. We review and compare various image enhancement methods, including histogram equalization, adaptive histogram equalization, contrast stretching, and noise reduction algorithms, to assess their effectiveness in enhancing images under low-light conditions. Additionally, we evaluate the performance of these techniques using quantitative metrics such as peak signal-to-noise ratio (PSNR) andstructural similarity index (SSIM) to measure image quality improvement. Furthermore, we discuss the advantages, limitations, and computational complexities of each technique, providing insights into their suitability for different low-light scenarios. Through this comparative study, we aim to provide a comprehensive understanding of image enhancement techniques for low-light conditions and their potential applications in real-world scenarios.

Keywords:

Image Enhancement, Low-Light Conditions, Histogram Equalization, Adaptive Histogram Equalization,Contrast Stretching, Noise Reduction, Image Quality, Peak Signal-to-Noise Ratio (PSNR), Structural Similarity Index (SSIM), Computational Complexity.

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79. Automated Medical Image Analysis For Early DetectionOf Disease.

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2. Ravinya K (III YR) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:
Automated medical image analysis plays a crucial role in the early detection and diagnosis of diseases using various imaging modalities such as X-rays, MRI, CT scans, and ultrasound. This paper provides an overview of the advancements and challenges in automated medical image analysis for early disease detection. We discuss the importance of early detection in improving patient outcomes and reducing healthcare costs. Furthermore, we review the state-of-the-art techniques in medical image analysis, including deep learning-based algorithms, computer-aided diagnosis (CAD) systems, and image segmentation methods, that enable automated detection of abnormalities and disease biomarkers.Additionally, we examine the impact of automated image analysis on different medical specialties, such as radiology, oncology, and cardiology, highlighting its role in improving diagnostic accuracy and efficiency. Through this overview, we aim to provide insights into the current state of automated medicalimage analysis and its potential for early disease detection.

Keywords:
Automated Medical Image Analysis, Early Disease Detection, Imaging Modalities, Deep Learning, Computer-Aided Diagnosis (CAD), Image Segmentation, Radiology, Oncology, Cardiology, DiagnosticAccuracy, Healthcare Costs.

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80. AI-Driven Healthcare: Predictive Models For DiseaseDiagnosis And Prognosis.

1. Mrs.D B.Rena Associate Professor / CSE Indra Ganesan College of Engineering, Manikandam, Trichy12.

2. Saranya P (III YR) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12

Abstract:

Artificial Intelligence (AI) has demonstrated significant potential in healthcare by enabling the development of predictive models for disease diagnosis and prognosis. This paper provides an overview of AI-driven healthcare with a focus on predictive models. We discuss the importance of predictive models in improving patient outcomes and healthcare delivery. Furthermore, we review the state-of-the- art AI techniques, including machine learning algorithms, deep learning models, and data-driven approaches, that are used to develop predictive models for disease diagnosis and prognosis. Additionally,we examine the challenges and opportunities associated with the implementation of AI-driven predictivemodels in clinical practice, including data privacy, interpretability, and regulatory considerations.Through this overview, we aim to provide insights into the role of AI-driven predictivemodels inadvancing healthcare and improving patient care.

Keywords:

AI-driven Healthcare, Predictive Models, Disease Diagnosis, Prognosis, Machine Learning, DeepLearning, Data-driven Approaches, Clinical Practice, Patient Care, Data Privacy, Interpretability,Regulatory Considerations.

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81. Enhancing Autonomous Vehicles Through Computer VisionAnd Ai.

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2. Suvalakshmi P (III YR) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:
Autonomous vehicles rely on advanced computer vision and artificial intelligence (AI) technologies to perceive and navigate the surrounding environment. This paper provides an overview of how computer vision and AI are enhancing autonomous vehicles. We discuss the role of computer vision in enabling perception tasks such as object detection, lane detection, and traffic sign recognition, which are essentialfor autonomous driving. Furthermore, we review AI techniques, including machine learning and deep learning, that are used to process and interpret visual data in real-time to make driving decisions.Additionally, we examine the challenges and future directions of computer vision and AI in autonomousvehicles, including robustness to environmental changes, regulatory considerations, and ethical implications. Through this overview, we aim to provide insights into the current state ofcomputer visionand AI in autonomous vehicles and their potential for transforming the future of transportation.

Keywords:
Autonomous Vehicles, Computer Vision, Artificial Intelligence, Perception, Object Detection, LaneDetection, Traffic Sign Recognition, Machine Learning, Deep Learning, Real-time Processing, Environmental Robustness, Regulatory Considerations, Ethical Implications

82. Adversarial Attacks And Defenses In Deep Neural Networks

1. Mrs.D.B.Rena Associate Professor / CSE Indra Ganesan College of Engineering, Manikandam, Trichy12.

2. Sweatha B (III YR) / CSE Indra Ganesan College of Engineering, Manikandam,Trichy 12.

Abstract:
Deep neural networks (DNNs) have achieved remarkable success in various applications but are vulnerable to adversarial attacks, where imperceptible perturbations to input data can lead to misclassification or erroneous behavior. This paper provides an overview of adversarial attacks and defenses in DNNs. We discuss the nature of adversarial attacks, including their goals, types, and impact on DNNs' robustness. Furthermore, we review the state-of-the-art defense mechanisms,d limitations of current defense strategies and discuss potential future directions in adversarial robustness research. Through thisoverview, we aim to provide insights into the landscape of adversarial attacks and defenses in DNNs andtheir implications for the security of machine learning systems.

Keywords:
Adversarial Attacks, Adversarial Defenses, Deep Neural Networks, Robustness, Adversarial

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83. Human-Ai Collaboration: Designing Interfaces For EffectiveTeamwork.

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Abstract:

Human-AI collaboration is becoming increasingly important across various domains, including healthcare, finance, and manufacturing, where humans and AI systems work together to achieve commongoals. This paper explores the design principles and considerations for interfaces that facilitate effective teamwork between humans and AI. We discuss the challenges and opportunities in designing interfaces that support seamless interaction and collaboration between human users and AI systems. Furthermore, we review interface design techniques, such as explainable AI, interactive visualization, and natural language processing interfaces, that enhance communication and understanding in human-AI teams.Additionally, we examine the ethical and social implications of human-AI collaboration interfaces, including issues of trust, transparency, and user autonomy. Through this exploration, we aim to provideinsights into the principles and practices of designing interfaces for effective human-AI collaboration.

Keywords:

Human-AI Collaboration, Interface Design, Teamwork, Explainable AI, Interactive Visualization, NaturalLanguage Processing, User Interface, Human-Computer Interaction, Ethical Considerations, Trust, Transparency, User Autonomy

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84. Performance analysis of proximity coupled microstrip patch antennas- Responses and applications

Dr.N.Vaijayanthi

,N.Gokila,P.Keerthana**Abstract:**

In this article, the design and performance of a novel rectangular microstrip patch antenna(RMPA) utilizing the dielectric substrate material FR4 of relative permittivity (£r = 4.3) and thickness (h = 0.254 mm) is proposed to operate at (f r = 28 GHz). Three different feeding techniques (microstrip inset line, coaxial probe, and proximity coupled line) are investigated to improve the antenna radiation performance especially the antenna gain and bandwidth using Computer Simulation Technology (CST) and High Frequency Structure Simulator (HFSS). The simulated frequency responses generally reveal that the proximity-coupled fed provides extremely directive pattern and maintain higher radiation performance regardless of its antenna size which is larger than the other considered feeding ones. With the presence of the three feeding techniques, the gain is improved from 5.50 dB to 6.83 dB additionally, the antenna bandwidth is improved from 0.6 GHz to 3.60 GHz at f r = 28 GHz when the reflection coefficient S11= -10 dB. Compared to the previously designed RMPA, the proposed design has the advantages of reliable size, larger bandwidth and higher gain, which make it more suitable for many 5G application systems.

Keywords: Feed techniques, gain, broadband bandwidth, microstrip patch, 5G

85."High effeciency single ended primary inductor converter (sepic) for electricalvehicle " Dr.N.Vaijayanthi

Abstract:

In order to enhance the power transformation stage's power transfer capabilities and efficiency, in this article, improved three-port two step-up single-ended primary-inductor converters (SEPIC) converter fed (Photovoltaic)PV- Hybrid Electric Vehicle was proposed. In comparison to the standard single-stage SEPIC, the proposed converter accepts a wider range of input voltages. +e proposed three-port converter uses a multiple-winding high-frequency transformer (HFT) to integrate the dual sources and provide greater voltage gain with lesser elements. Furthermore, by predicting the drive torque need, the power management algorithm (PMA) included with the proposed PV-hybrid electric vehicle (HEV) minimizes the drive motor's power consumption. An experimental model with a power output of 6 kW and a voltage range of 12 to 600 volts has been created and tested. +e designed model has 94.11% efficiency.

Keywords: Single-ended primary-inductor converters (SEPIC), PV- Hybrid Electric Vehicle,

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86. High-frequency transformer (HFT), Power management algorithm (PMA), Hybridelectricvehicle (HEV) Hybrid solar and wind (srg) based standalone systems

Dr.N.Vaijayanthi

Abstract:

Deep neural networks (DNNs) have achieved remarkable success in various applications but are vulnerable to adversarial attacks, where imperceptible perturbations to input data can lead to misclassification or erroneous behavior. This paper provides an overview of adversarial attacks and defenses in DNNs. We discuss the nature of adversarial attacks, including their goals, types, and impact on DNNs' robustness. Furthermore, we review the state-of-the-art defense mechanisms.d limitations of current defense strategies and discuss potential future directions in adversarial robustness research. Through thisoverview, we aim to provide insights into the landscape of adversarial attacks and defenses in DNNs andtheir implications for the security of machine learning systems.

Keywords:

Adversarial Attacks, Adversarial Defenses, Deep Neural Networks, Robustness, Adversarial Training,Input Preprocessing, Model Regularization, Security, Machine Learning.

87. Design and implementation of VEDIC algorithm inSCADA

Dr.M.Bhuvaneswari,B.Karthikeyan,B.Rajan

Abstract:

The ancient Vedic mathematics has a set of 16 sutras and 13 sub sutras. These sutras give suitable method for arithmetic calculations. The Vedic formulas requires less time than the regular formulas or method of calculations [1]. Multiplier is an important block in many digital systems. This paper presents a 32-bit Vedic multiplier using UrdhvaTiryagbhyam sutra of ancient Vedic mathematics. The 32-bit Vedic multiplier is implemented using 16-bit multipliers and adders. The 16-bit multipliers are basic blocks in the design by which the input bits are multiplied and their results are added by using the adders. The Vedic multiplier can be used in many fast computing processors because of their less time delay and less number of slice LUTs. The result discusses the delay and number of slice LUTs for the implemented 32-bit multiplier. The paper also discusses the methodology of implementation.

Keywords: UrdhvaTiryagbhyam, Vedic Mathematics, Vedic Multiplier, VHDL, Xilinx Spartan- 6 FPGA.

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88. Microgrid protection and loadmanagement

Dr.M.Bhuvaneswari

Abstract:

The increased levels of distributed generator (DG) penetration and the customer demand for high levels of reliability have attributed to the formation of the Microgrid concept. The Microgrid concept contains a variety of technical challenges, including load management and anti-islanding protection discrimination strategies. This paper provides a novel scheme in which loads and DG are able to detect the conditions where the load of the island cannot be sufficiently supplied. In these instances, a load shedding algorithm systematically removes loads from the system until an island can be maintained within satisfactory operating limits utilizing the local DG. The concept of an Intelligent Load Shedder (ILS) module is proposed in this paper. This module is connected in series with non-critical loads in order to detect the conditions where that non-essential load should be isolated from an island. This module must be capable of communicating with the static transfer switch (STS), which is the intelligent isolator associated with the island. The STS will also be capable of sending and receiving data with each DG's islanding protection device. The combined algorithmic control of the STS, ILS module and DG islanding protection device forms the Intelligent Load Management algorithm. This algorithm is capable of islanding protection and load shedding irrespective of the use of communications. Thealgorithms within this paper are simulated using MATLAB script. The results show that, on a theoretical level, the intelligent load management scheme described in this paper can be used to detect the conditions where an insufficient load is available using local parameters. Load shedding coordination is also shown to be possible with and without the use of communications between the STS, ILS module and DG islanding protection module.

Keywords: Distributed generator, Microgrid , Intelligent Load Shedder (ILS), static transfer switch (STS), MATLAB

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89. On-road wireless battery charging method for electric-vehicles

Dr.M.Bhuvaneswari

Abstract:

Recent fossil fuel shortages and global warming related problems have caused a substantial shift from internal combustion engine vehicles towards EVs. This paper explores the thorough review of battery charging infrastructure from wired connection to on-road wireless charging for an EV. The initial part of the paper deals with the wired charging and its power electronics infrastructure. The later portion deals with the wireless charging where both static and On-Road types are discussed. Furthermore, various aspects of wireless power transfer are also discussed. The Market scenario and future growth prospects are reviewed and presented in last section of the paper.

Keywords: Wired charging, static WPT, on-road WPT.

90. Smart ATM surveillance system using GSMtechnology

Ms.R.Bhuvaneswari,A.Chandru,M.Hariharan

Abstract:

Automated Teller Machine (ATM) Surveillance System is used to provide protection against the frauds. Frauds related to the ATMs are increasing day by day which is a serious issue.ATM is a Smart System based on the embedded technology that provide multiple points of protection against physical, electronic theft and protecting their installations. This Paper proposes a system which aims to design real time monitoring and controlling system. The systemis implemented using various sensors, GSM and GPS technologies. The sensors are continuouslymonitoring for any illegal activities happening in its ATMs surroundings. Also discussed about the implementation of the proposed system, the sensors and the other supporting hardware that are being used to improve this system.

Keywords:ARM controller LPC 2148, Global system for Mobile communication, GPS, MEMSSENSOR, Passive infrared sensor (PIR), Force sensitive resistor (FSR).

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91. Optimal techniques for the estimation of maximum loadability margin of electricpowersystem

Ms.R.Bhuvaneswari

Abstract:

Estimating the margin in the loadability of the power system is essential in the real time voltage stability assessment. Voltage stability is currently one of the most important research areas in the field of electrical power system. The condition of voltage stability in a power system can be known using Voltage Stability Indices (VSI). The loading margin is one of the most widely known and accepted VSI. Voltage Stability Indices can be useful for estimating the distance from the current operating point to voltage collapse point. The indices can either reveal the critical bus of a power system or the stability of each line connected between two buses in an interconnected network or evaluate the voltage stability margins of a system. The comparison of the performances of these indices is presented and the effectiveness of the analyzed methods is demonstrated through simulation studies in IEEE 14 bus reliability test systems

Keywords: Loading margin, Voltage stability assessment, Voltage collapse, Voltage stabilityindex.

92. An Optimized-Throttled Algorithm For Distributing Load In CloudComputing

Ms.R.Bhuvaneswari

Abstract:
Cloud computing is a new area with many promising applications for both established businesses and individual users. This is a development of the idea of decentralized computing. Based on the concept of "on demand" services, it delivers data, applications, and infrastructure inresponse to users' immediate requests . Load balancing, in which the load is distributed among many cloud servers or nodes, improves efficiency. It's the single most crucial element in maximizing the use of available resources. Load balancing has emerged as a critical process in cloud computing infrastructures. To meet the needs of such a large user base, a distributed solution is necessary, since centrally managing one or more idle services is neither practical nor cost-effective. It's impossible to give certain users control over individual computers. d. Cloud Analyst is used to do in-depth research and comparisons. We compared our results to those of the more seasoned Round Robin and Throttled algorithms. In addition, simulation findings show that the proposed algorithm has improved response times and processing times in the cloud data center, demonstrating its superiority over current methods.
Key Words: Cloud Computing, Load Balancing, Processing Time, Response Time

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93.Secure data transmission using clustering modification direction

Mrs.P.SanthanaSelvi,K.Madhubala, J.Sannya Devi

Abstract:

In wireless sensor networks, services may fail due to various reasons, including radio interference, de-synchronization, battery exhaustion, or dislocation. Such failures are caused by software and hardware faults, environmental conditions, malicious behavior, or bad timing of a legitimate action. In general, the consequence of such an event is that a node becomes unreachable or violates certain conditions that are essential for providing a service, for example by moving to a different location. The node can no further provide sensor data about its former location. In some cases, a failure caused by a simple software bug can be propagated to become amassive failure of the sensor network. This results in application trials failing completely and is not acceptable in safety critical applications. The open nature of the wireless communication, thelack of infrastructure, the fast deployment practices, and the hostile deployment environments, make them vulnerable to a wide range of intrusions and security attacks. The motivation for attacking a sensor networks could be, for example, to gain an undeserved and exclusive access tothe collected data. There has been a multitude of attacks described in the literature: probabilistic data packet dropping, topology manipulation, routing table manipulation, prioritized data and control packet forwarding, identity falsification, medium access selfishness etc

Key Words: WSN, OSI, ELMO, GUI, SWS, Mobility, Nodes

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94. IoT devices enabled for data analytics intelligent decision making using machinelearningalgorithms: A Brief Literature Review

Mrs.P.SanthanaS

elviAbstract:

New advances in the realm of information technology have led to an exponential increasein the amount of IoT data. IoT data, which is produced at enormous volumes and from a range ofdevices and sensors, including those that measure temperature, motion, sound, and other variables, has substantial gaps, is loud, and is extremely unstructured. Therefore, it is challengingfor general analytics and business-intelligence tools that are accessible to handle large amounts of Internet of Things data. The only way to solve the aforementioned issue is using big IoT data analytics. This work analyzed open-sourced and proprietary big IoT data analytics platforms and presented a comparative analysis with the aim of assisting future big IoT data analytics research. In order to gain insightful knowledge and make wise decisions, businesses now depend on big data analytics. The well-known frameworks for big data processing and analytics mentioned in the paper. In terms of functionality, ease of use, scalability, and performance, this study compares and contrasts different data analytics tools. We seek to ascertain the advantages and disadvantages of each framework by examining a number of factors, including fault tolerance, programming paradigms, data processing models, and ecosystem tools. Businesses can choose the best framework for their unique Big Data analytics needs with the aid of the study's findings.

Key Words: IoT, Data analytics, Machine Learning, Decision making

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95. Battery Application Studies of Polypyrrole with Bio-waste Material asComposite

Mrs.P.SanthanaSelvi

Abstract

As there is a need of research and development for the recycling and usage of a bio waste material to minimize the extensive usage of conventional conducting materials, the study of electric properties such as conductivity, electric modulus, cyclic voltammetry, dielectric constant, and AC impedance analysis are carried out by using Polypyrrole with sugarcane bagasse ash as its composite. Pyrrole likely to be an organic compound with insulation propertieshas been studied to exhibit many electrical and dielectric characteristics on its polymerization through the standard procedure of chemical oxidation and addition of sugarcane bagasse ash. Thecomposites of Polypyrrole with different weight percents of sugarcane bagasse ash have been examined and compared by drawing the results. The surface topography and sample compositionare analyzed using Scanning Electron Microscope, whereas the impedance analyzer is used to measure the electrical impedance with the changing frequency. The crystal structure of both the solutions is obtained using X-ray diffraction and the result values acquired by X-ray, SEM, impedance analyzer is represented graphically using the software Origin by inputting the discretevalues. Hence this experimental approach provides that sugarcane bagasse ash improves theelectrical properties of the Polypyrrole to be good organic dielectric material for storage devices which hence finds application in batteries, electrodes, sensors, switching devicesand so on.

Key Words: PolyPyrrole (PPy), Scanning Electron Microscope (SEM), Sugarcane Bagasse Ash (SBA), Origin, X-Ray Diffraction (XRD), Lattice Boltzmann Method(LBM), Lanthanum Calcium Manganite (LCM)

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96. A sudden infant death syndrome monitoring using smart wearablesystem

Ms.R.Nithya, J.Keerthana, M.Soorya

Abstract:

Sudden Infant Death Syndrome (SIDS) is one of the major causes of death among infants during their sleep. To increase the safety of the Infants, we matched different emergent research fields for the development of Baby Night Watch. This Smart Wearable System (SWS), developed under the context of the European Texas Instruments Innovation Challenge (TIIC) 2015, is composed by the following elements: a Wearable IoT Device, a Gateway and the H Medical Interface. The Wearable IoT Device is a wireless sensor node integrated in a Chest Belt, and it has the capacity to monitor the following parameters: body temperature, heart and breathing rates and body position. After a minimal data processing, this set of information is sentto the Gateway, via ZigBee technology, and it is accessible to the user through the H Medical Interface. If a critical event occurs, the device will trigger an alarm, visible and audible in the proximity, and sends a distress message to a mobile application. The Baby Night Watch is an important tool for medical studies, since it allows the visualization of previous physiological dataand exports it to different types of datasets. Experimental tests have proven that the SWS have the potential to identify situations that could be potentially life-threatening for an infant.

Key Words: E-textile; Internet of Things; Smart Textiles; Smart Wearable System; Sudden Infant Death Syndrome

97. Blockchain technology and its pioneering applications: A comprehensivereview

Ms.R.Nithya

Abstract

Block chain technology, initially conceived as the foundational framework for crypto currencies, has emerged as a transformative force with far-reaching implications across various industries. This research paper provides a comprehensive examination of the fundamentals, key components, and pioneering applications of block chain technology. It explores the decentralizedand distributed nature of block chain, its cryptographic underpinnings, and the consensus mechanisms that ensure secure and transparent record-keeping. The paper delves into the diverse applications of block chain beyond the realm of crypto currencies, highlighting its impact on

SCM, smart contract, identity management, healthcare, voting systems, real estate, and cross- border payments. Through a meticulous analysis, it uncovers how block chain enhances transparency, reduces fraud, and revolutionizes traditional processes in these sectors. Despite its transformative potential, block chain faces challenges, including scalability issues and environmental concerns associated with certain consensus mechanisms. The research also outlines the regulatory landscape and explores the evolving trends and future directions of block chain technology, such as efforts towards interoperability, integration with AI and IoT, and the development of Central Bank Digital Currencies (CBDCs). In conclusion, the paper underscores the profound impact of block chain on reshaping the digital landscape and calls for ongoing research and development to address challenges and unlock the full potential of this revolutionary technology. This comprehensive overview serves as a valuable resource for scholars, industry practitioners, and policymakers seeking a deeper understanding BCT and its dynamic application across sectors.

Key Words: Crypto Currency, Decentralized, Distributed, Cryptographic, Transparency

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98.Segmentation of tumors in medical images by using region growingmethod

Mr.K.Kumar,K.Vaishnavi

Abstract:

Interaction increases flexibility of segmentation but it leads to undesirable behavior of an algorithm if knowledge being requested is inappropriate. In region growing, this is the case for defining the homogeneity criterion, as its specification depends also on image formation properties that are not known to the user. We developed a region growing algorithm that learns its homogeneity criterion automatically from characteristics of the region to be segmented. The method is based on a model that describes homogeneity and simple shape properties of the region. Parameters of the homogeneity criterion are estimated from sample locations in the region. These locations are selected sequentially in a random walk starting at the seed point, and the homogeneity criterion is updated continuously. This approach was extended to a fully automatic and complete segmentation method by using the pixels with the smallest gradient length in the not yet segmented image region as a seed point. The methods were tested for segmentation on test images and of structures in CT and MR images. We found the methods to work reliable if the model assumption on homogeneity and region characteristics are true. Furthermore, the model is simple but robust, thus allowing for a certain degree of deviation from model constraints and still delivering the expected segmentation result.

Key Words: Segmentation, Region Growing, Adaptive Methods

99. WarFieldRobot

Mr.K.Kumar

Abstract:

The Warfield robot is a specialized robot designed for use in military operations. The surveillance robot is a highly advanced system that can be used in a variety of applications, such as security, search and rescue, and environmental monitoring. Its ability to provide realtime feedback and collect data make it an invaluable asset to organizations and agencies that require situational awareness in different environments.

Keywords : Military Operations, Surveillance, Monitoring, Real-Time Feedback, Security,Search And Rescue.

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100. Green Solutions to Clayey Soil Stabilization: Harnessing Ground Granulated BlastFurnace Slag and Biogases Ash for Sustainable Geotechnics

Mr.K.Kumar

Abstract

Soil enhancement constitutes a procedure directed at fortifying the durability and potencyof soil. This encompasses altering the features of less steadfast soil to amplify its compressive strength or adjusting the qualities of foundational soil to secure their appropriateness. Through bolstering shear strength and regulating soil shrink-swell tendencies, it heightens the capacity ofa subgrade to support pavements and foundations. The strengthened soil improves tensile strength, bearing capacity, and overall soil functionality. The process of soil fortification encompasses the application of diverse chemicals. Among the notable strategies for amplifying the engineering characteristics of problematic soil is chemical fortification. In the present contextof diminishing resources and energy usage, there is an increasing inclination towards employing discarded materials as soil fortifiers. Sugarcane bagasse ash, a silica-enriched byproduct derived from the combustion of sugarcane bagasse, stands out as one such substance. This investigation aims to contrast the fortifying efficacy of lime and sugarcane bagasse ash. Laboratory analyses were executed to evaluate the influence of different proportions of GBFS and bagasse ash on the fortification of clayey soil. The results suggest that the GBFS fortification technique can significantly augment the geotechnical features of clayey soil, providing pragmatic and enduring resolutions for construction initiatives.

Key Words: Soil Stabilisation, Bagasse Ash, GBFS, Liquid Limit, Plastic Limit

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101. Secured transmission of data hiding in image usingStenography

Mr.S.Balakrishnan,N.vairavelmanikandan

Abstract:

Data is one of the most relevant and important term from the ancient Greek age to modern science and business. The amount of data and use of data transformation for organizational work is increasing. So, for the sake of security and to avoid data loss and unauthorized access of data we have designed an image Steganographic algorithm implementing both Cryptography and Steganography. This algorithm imposed a cipher text within a cover image to conceal the existence of the cipher text and the stego-image is transferred from sender to intended receiver by invoking a distributed connection among them to achieve the dataauthenticity.

Key Words: Cryptography, Steganography, RSA, RMI Architecture, Distributed connection,JPEG image

102. A Voice Controlled Vehicle for the Aid of DisabledPerson

Mr.S.Balakrishnan

Abstract

A voice-controlled robot is a robotic system that is operated and controlled by user voice commands via a mobile phone. The concept revolves around creating a robot that can approach and assist individuals with disabilities in wheelchairs, specifically those who have impairments in both their hands and legs, rendering them unable to move independently from one location to another. These individuals currently depend on others for mobility. To address this issue, the proposed solution involves the development of a prototype known as the "Voice Controlled Robot". When this technology is integrated into a wheelchair, individuals with disabilities can effortlessly navigate from one location to another independently through voice commands. The wheelchair responds to these commands, automatically facilitating movement to desired destinations. The primary objective behind creating this robot is to empower disabled individualsby providing them with a means to move autonomously using voice-activated controls.

Key Words: Voice-controlled, Wheelchairs, Objective

103. Decision based architecture for removal of impulse noise inImages

Mrs.B.Saraswathi, R.Nithya

Abstract:

The main objective of this paper is to design an efficient architecture for removal of random-valued impulse noise from captured image. A good image denoising model property is that, it will remove noise while preserving edges. The decision-tree-based denoising method (DTBDM) is the proposed methodology. It consists of decision tree based impulse detector, to detect the noisy pixel and employs an effective design and to locate the edge by an edge preserving filter to reconstruct the intensity values of noisy pixels. The proposed techniquecan obtain better performance in terms of both qualitative and visual quality than the previous low complexity denoising methods. Further, it is enhanced using modified carry select adder in order to improve execution time. Here, serial adder is replaced with modified square root CSA to reduce computational time and area.

Keywords: Image Denoising, Impulse Noise, Impulse Detector, Carry Select Adder.

104. Student Engagement Monitoring in Online Learning Environment Using FaceDetection.

Mrs.B.Saraswathi

Abstract

Student engagement is one of the most important factors in student achievement. Many schools are aware of this and have initiated programs to monitor how engaged students are in school. Tracking student engagement not only helps teachers assess their teaching methods; it also helps administrators know which aspects of the school environment need more attention. In order to measure student engagement, many schools can incorporate systems that track a child's response time during individual lessons. We all know that the internet has changed education forever, and for the better. An accessible online world has allowed students to learn at their own pace in a more natural environment with new opportunities for collaboration, creativity, and growth. But what is not commonly understood is just how crucial student engagement on an online course can be to its success. Student engagement is fundamental to educational success. Engagement monitoring can help identify what students find interesting and engaging in the classroom, what they want, what makes them uncomfortable, and what they need.

Key Words: Online Monitoring, Face Recognition, Student Engagement. Online Course, Classroom Engagement.

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105. A Real Time Advance Automated Attendance System using Face-NetAlgorithm

Mrs.V.Elakkiya, R KosiAnanth, A.Raashitha Jannath

Abstract:

Proposed system presents a pioneering "RealTime Advance AutomatedAttendance System using Face-Net Algorithm" designed to alleviate the burdens associated with manual attendance-taking methods prevalent in educational institutions. Leveraging state-of-the-artfacial recognition technology, the system automates the attendance tracking process, enhancing accuracy and efficiency. Proposed system encompasses the development of a robust system that incorporates facial detection and recognition algorithms, database management, and user interfaces tailored to the needs of educators and administrators. By capturing and processing facial data, the system enables realtime attendance recording while maintaining stringent privacyand data security measures. Through rigorous testing and evaluation, the system demonstrated itseffectiveness in diverse classroom settings, offering a practical solution for attendance management. This project seeks to contribute to the ongoing digital transformation of education, promoting streamlined administrative processes and allowing educators to focus more on their core teaching responsibilities. The Face Recognition-Based Attendance System represents a forward-thinking approach to attendance management, aligning with contemporary technologicaltrends and addressing the challenges posed by conventional methods. As educational institutions seek to optimize their operations, this system stands as a testament to the potential for technologyto enhance administrative processes and improve the overall educational experience.

Key Words: Face-Net, Attendance System, Face Recognition

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106. Real Time Crime Detection using DeepLearning

Mrs.V.Elakkiya

Abstract:

Crime detection and prevention have always been critical concerns for society. With the rapid advancements in technology, particularly in the field of deep learning and artificial intelligence, new opportunities have emerged to enhance real-time crime detection capabilities. Deep learning techniques have demonstrated remarkable potential in analysing various types of data sources, such as surveillance footage, sensor data, and social media feeds, to identify criminal activities, predict incidents, and aid law enforcement agencies in proactive responses. This survey paper seeks to provide a thorough overview of the application of deep learning in real-time crime detection. This paper digs into the various deep learning architectures andmethodologies employed for this purpose, explore the challenges and limitations associated with these techniques, and discuss ethical and legal considerations.

Key Words: Crime Detection, Crime Datasets, Deep Learning, CNN, LSTM.

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107. Sounding the Keys: A Comprehensive FFT-Based Approach for Piano NoteDetection

Mrs.S.Rahamathnisha, S.Aishwariya, B.Deepika

Abstract:

Piano - a popular skill for both young and adults alike is something that requires proper practice and guidance. When learning a new skill, a tutor plays an important role as the learner familiarizes themselves with the foreign skill. However, a tutor cannot always monitor and guidethe student. While feedback from a professional educator is highly valuable, this traditional method of learning the piano is not viable for all; appointing a tutor becomes tedious and expensive. While practice makes perfect, it is equally important to practice correctly. Lack of proper guidance at the early stages of learning may lead to the development of incorrect practices. Timely and consistent feedback motivates players and ensures accurate practices from early learning stages. This research explores the application of signal processing, specifically utilizing the Fast Fourier Transform algorithm. By leveraging FFT's capabilities, our research demonstrates the successful development of models that exhibit accurate note identification. The findings finally highlight the transformative potential of integrating signal processing into the piano learning process. This research aims to make learning the arts more accessible to all, to ensure that keen learners are not hindered from learning the piano. The proposed system is designed to assess piano performances in real-time using the Fast Fourier Transform (FFT) algorithm and thresholding techniques for note identification. The proposed algorithm aims to improve the music evaluation process by providing real- time assessment, eventually enhancing the quality of automated assessments of piano performances. This paper's main emphasis is on the implementation of the FFT algorithm, thresholding methods, and real-time feedback.

Key Words: Fast Fourier Transfer algorithm, High Frequency Content (HFC) detection, Thresholding methods, and Real-time assessment.

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108. CMOS Based ImageSensors

Mrs.S.RahamathNisha

Abstract

CMOS image sensors are pivotal in modern imaging devices due to their compactness, energy efficiency, and costeffectiveness. Operating on the principle of light-to-digital conversion, these sensors utilize pixel-level circuitry for noise reduction and faster data readout. Their advantages include low power consumption, integrated processing, and high-speed capabilities. As a result, CMOS image sensors are widely used in consumer electronics, automotive, medical imaging, industrial automation, and scientific applications, shaping the future of digital imaging technology.

Key Words: CMOS; optoelectronic imager; infrared imaging; focal plane array.

109.Synopsis of Facial Emotion Recognition to Emoji Conversion

Mrs.G.Keerthana,AneeshaA,Manikandan.M

Abstract

This project presents a real-time Facial Emotion Recognition (FER) to Emoji Conversion system developed using OpenCV, TensorFlow, and NumPy. The system aims to identify and classify human emotions from facial expressions captured in real-time through a webcam. The FER system leverages the powerful image processing capabilities of OpenCV, the computationalefficiency of NumPy, and the machine learning techniques provided by TensorFlow. A model is trained on a large dataset of facial images labeled with their corresponding emotions. The trainedmodel is then used to predict emotions from facial expressions captured by a webcam in real- time and the conversion of recognized emotions into corresponding emojis, providing a visual representation ofthe detected emotion

Key Words: Facial Emotion Recognition (FER), OpenCV, TensorFlow, NumPy, ComputerVision

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110. Design and Implementation of a Wi-Fi Controlled Car Using NodeMCU, ArduinoUNO,and Blynk IOT.

Mrs.G.Keerthana

Abstract:

This project proposes a Wi-Fi controlled car using NodeMCU. Arduino UNO, and BlynkIoT. NodeMCU is a microcontroller board that is based on the ESP8266 Wi-Fi chip. The Arduino UNO is a microcontroller board that is popular among hobbyists and makers. BlynkIoT is a cloudbased platform that makes it easy to create and manage IoT devices. The Wi-Fi controlled car works by using the NodeMCU board to connect to a Wi-Fi network. The NodeMCU board then receives commands from the BlynkIoT app and sends them to the Arduino UNO board. The Arduino UNO board then controls the motors of the car to move it in the desired direction. This project is relatively inexpensive to build and easy to use, making it a good option for hobbyists and makers. The Wi-Fi controlled car can be used for a variety of applications, including hobby, education, and research. In the future, we can expect to see Wi-Fi controlled cars that are equipped with additional features, such as cameras, sensors, and artificial intelligence. This will enable Wi-Fi controlled cars to perform more complex tasks, such as autonomous driving and object detection. Overall, Wi-Fi controlled cars have the potential to revolutionize the way we interact with the world around us.

Key Words: Wi-Fi controlled car, NodeMCU, Arduino UNO, BlynkIoT, Internet of Things(IoT), Robotics, Cloud

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111. Design of low complexity test pattern generator for Built in SelfTest

Mrs.P.JencyLeena,B.Saranya

Abstract:

This paper discusses about low power test pattern generator used for testing circuits. The testing of VLSI circuits entitles many challenges in terms of area overhead, power and latency. The Low power test pattern generation is a very crucial technique for testing of a complex architecture of VLSI design. As technology progresses, the growing demands of long life batteries in battery operated devices have set ways for new ideas that reduce the power consumed in these devices. As we know that during testing when the device's normal functioning mode is off, the dissipation of power is approximately 200% more than that of normal functioning mode. So a method is proposed to minimize the concerned power at testing mode itself in the very beginning. It is a very important step needed while testing a circuit. Over here, LFSR is used for generating test patterns. And to this LFSR, two algorithms will be implemented. One is by dividing a circuit into two parts and the other way is to using a clock divider circuit. After implementing an efficient LFSR along with the two algorithms, we are able to reduce the average power of LFSR from 262.3nW to 247.7 nW (Algorithm 1) and 235.9 nW (Algorithm 2).

Key Words: Test Pattern Generator, LFSR, seed, switching activity, D Flip Flop, Multiplexers

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112. Emergency Vehicle Sound Detection Systems In TrafficCongestion

Mrs.P.JencyLeena

Abstract:

Traffic congestion at junctions often results in extended waiting times for vehicles attempting to cross road lanes, posing a significant challenge for emergency vehicles. The delay caused by congested intersections can potentially jeopardize lives, emphasizing the critical need for efficient solutions. This research addresses the problem of emergency vehicles navigating through high-density traffic, particularly when approaching traffic signals. The proposed solutioninvolves the utilization of sound sensors to detect the frequency of sirens emitted by emergency vehicles nearing traffic signals. Additionally, the system employs the Xbee protocol to monitor the movement of the emergency vehicle, facilitating its passage through the corresponding traffic lane. The application of this module extends beyond conventional emergency vehicles and proves advantageous for high-priority vehicles such as VIP convoys and police jeeps. By prioritizing the movement of emergency vehicles through congested traffic signals, this research aims to enhance response times, mitigate risks, and ultimately contribute to the preservation of lives in emergencies.

Key Words: IoT, Arduino Uno, Traffic Congestion, Emergency Vehicles, Traffic Signal, Sensors, Sound Detection, Distance

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113. Height Resolution implementation of digital pulse width modulators based on DCM and IODELAY

Dr.R.RajaMohamed,S.Vinoth

Abstract:

Conventional pulse width modulators (PWM) for radar detection application are analoguewith complex architecture or digital with a low degree of accuracy. PWMs implemented with simple architecture and high resolution are essential requirements of modern embedded system for performing diversified control tasks. The previously reported PWMs are not ideal in terms of simple architecture, and high resolution. This work proposed four digital pulse width modulators that cater to these two major design concerns. Mixed-mode clock manager(MMCM) block and digital programmable circuit are employed as fundamental resources to construct the field programmable gate array(FPGA) based DPWM. Corresponding solutions together with simple architecture and high resolution DPWMs based on Flip flop(FF), counter, and carrychain utilizing ZYNQ – 7020 FPGA are discussed and presented respectively. At the same time, experimental results indicate a high resolution of 20.03ps achieved by the MMCM based DPWM, while the carry chain based DPWM leads to a 592ps resolution. The proposed architectures are validated using ALINX AX7020 development board.

Key Words: Field-Programmable Gate Arrays (Fpgas), Digital Pulse Width Modulation (DPWM), Carry Chain, Signal Resolution.

114. Live CCTV Object Detection / Tracking and Storage and Storage of ExpressiveFootage :A Survey.

Dr.R.RajaMohamed

Abstract:

This project focuses on enhancing CCTV storage efficiency in traffic cameras by selectively recording relevant data. Leveraging YOLOv3 pre-trained weights, the system calculates frame-to-frame distance to identify significant changes, preventing storage loss. Integration with OpenCV's classification. The proposed model not only accurately identifies objects causing changes but also encloses them with precise bounding boxes, offering a streamlined solution

Key Words:: Yolov3, Object Detection, Open CV

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115. House Price Anticipation with Machine Learning

Dr.R.RajaMohamed

Abstract

The real estate industry has witnessed a growing interest in predictive analytics and machine learning techniques for accurate house price prediction. This abstract provides an overview of a study that employs Artificial Neural Networks (ANNs) to predict house prices. ANNs have demonstrated exceptional capabilities in handling complex nonlinear relationships in data, making them well-suited for this task. The study utilizes a dataset containing various attributes related to houses, such as square footage, number of bedrooms and bathrooms, location, and amenities. These features are preprocessed in order to uncover valuable insights from the data, techniques such as addressing missing values and outliers, as well as applying feature engineering methods, are utilized. The network undergoes training using historical housing data with established price information. During training, back propagation and optimization algorithms are employed to minimize the prediction error. Hyper parameter tuningis conducted to optimize the model's performance. In order to gauge the model's precision, a range of assessment measures, including Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and R-squared (R^2), are utilized. The trained ANN is capable of predicting house priceswith a high degree of accuracy, outperforming traditional regression models.

Key Words: House price prediction, Artificial Neural Networks, Machine Learning, Predictive Analytics, Real Estate, Regression, Feature Engineering, Hyper parameter Tuning

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116. Implementation of constant cycle frequency hopping with generation of SPUR freePWMcontrol signal for buck regulator in FPGA

Mrs.M.Nandhini

G.Priyanga

Abstract:

The project is concerned with the design, synthesis, and the implementation of pulse width modulation (PWM) on FPGA. The project develops high frequency PWM generator architecture by using FPGA. The resulting FPGA frequency depends on the target FPGA speed grade and the duty cycle resolution requirements.In the PWM architecture, we are going to design blocks like N-bitregister, N-bit counter, comparator and R S latch and complete PWM architecture is also design and simulated. The VHDL language is used in the design process of PWM.Quartus II version 13.0 software is used to perform the simulations. Pulse-width modulation (PWM) is a modulation technique that changes the width of the pulse, formally the pulse durationThe simulation was performed on the architecture and after verifying the results this VHDL code is implemented on Cyclone-IVE FPGA of family EP4CE115F29C7 by using Quartus-II software

Key Words: Pulse Width Modulation, Field Programmable Gate Array, Hardware DescriptionLanguage, Altera Quartus II

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117. Heart Disease Prediction using MachineLearning

Mrs.M.Nandhini

Abstract:
Cardiovascular diseases (CVDs) constitute a global health crisis, with heart disease at its forefront, demanding early and precise diagnosis. This research endeavors to address this critical issue through advanced machine learning and neural network-based predictive modeling. Our primary goal is the creation of a robust predictive model for accurately classifying individuals into heart disease and non-heart disease categories, leveraging diverse clinical attributes. We employ high-performance computing infrastructure and a comprehensive software stack, including TensorFlow and scikit-learn, to develop, train, and evaluate the model. The study delves into methodological intricacies, experiment results, and the transformative potential ofmachine learning in cardiology, with an emphasis on both technical nuances and clinical implications. This research represents a pivotal step toward the application of artificial intelligence in healthcare, poised to elevate cardiovascular healthcare standards and patient care quality.

Key Words: Heart Disease, Machine Learning, Neural Networks, Predictive Modeling, Artificial Intelligence, Healthcare

118. Emission reduction by converting conventional bicycle to voice controlled solarelectricbicycle with location tracking

Mrs.M.Nandhini

Abstract

This project deals with design and fabrication of a low-cost portable electric bicycle kit, which can be mounted an existing bicycle. It has two modes of drive, one is by pedaling and other one is by using electric motor. However all the retain the ability to be pedaled by the rider. Motor disadvantage of conventional bicycle is it increase rider fatigue on long distance travel. There by implementing an external drive electric motor which can be switched between pedalingand electric drive and this will help of increase the range of travel, better riding of experience and reduce rider fatigue 20-40km on a single charge. Bicycle can be travel at a speed of km/hr. This idea is help in future to protect out fuels from getting extinguished. All present electric vehicle drive on ac power.

Key Words: Solar energy, Bicycle.

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119. Implementing Job Queue Management By Using Priority Queue and RoundRobin

Mrs.D.Kokila, F.Arokia Alex

Abstract:

This paper introduce a new approach for scheduling algorithms which aim to improve real time operating system CPU performance. This new approach of CPU Scheduling algorithm is based on the combination of round-robin (RR) and Priority based (PB) scheduling algorithms. This solution maintains the advantage of simple round robin scheduling algorithm, which is reducing starvation and integrates the advantage of priority scheduling. The proposed algorithm implements the concept of time quantum and assigning as well priority index to the processes. Existing round robin CPU scheduling algorithm cannot be dedicated to real time operating system due to their large waiting time, large response time, and large turnaround time and less throughput. This new algorithm improves all the drawbacks of round robin CPU scheduling algorithm. In addition, this paper presents analysis comparing proposed algorithm with existing round robin scheduling algorithm focusing on average waiting time and average turnaround time

Key Words: Average turnaround time , Average waiting time, Priority based , Round robin (RR), Scheduling algorithms.

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120. Segmented Sigma Delta DAC using Coarse and FineArchitecture

Mrs.D.Kokila

Abstract:

Sigma–delta (ΣΔ) digital-to-analog converters (DACs) find widespread application in built-in self-test (BIST) setups for programmable DC voltage generation due to their superior linearity; however, this advantage comes at the cost of substantial digital memory requirements and the need for a reconstruction filter with a comparatively large silicon area footprint. This article suggests a segmented architecture for programmable DC voltage generators that use sigma-Delta (DAC) digital to analog converters (DACs). Although DACs are renowned for their great linearity, they have some disadvantages, including the use of memory needs for digital dataand the demand for a sizable reconstruction filter. By utilizing two sub-DACs, the proposed segmented DAC design addresses these difficulties. This method offers two major benefits: significant memory savings and a reduction in the footprint size of the reconstruction filter. Overall, the articles highlight significant memory and silicon space savings over traditional unsegmented DAC architecture, demonstrating the efficiency of the segmented DAC architecture.it is a desirable option for programmable DC voltage generators in BIST schemes due to these benefits.

Key Words: Sigma–delta (ΣΔ) Digital-To-Analog Converters (Dacs), Built-In Self-Test (BIST),MATLAB.

121. Robust Unit Commitment With VirtualSynchronous Renewables

Dr.G. Malathy [1] Arun praveen raj A [2] [1] Professor, [2] UG Students

Abstract:

With the increasing penetration of renewable energy sources and the consequent displacement of synchronous generators, the frequency stability of power systems deteriorates since RESs cannot participate in active power and frequency control. By emulating the outer characteristics of SGs and deloading a controllable margin, RESs can also keep headroom and provide frequency responses. This paper focuses on incorporating virtual synchronous renewables into the unit commitment to optimize the joint scheduling of energy production and spinning reserves.VSRs, can keep deterministic regulation headroom and participate in power balance regulation. Second, a robust security- constrained unit commitment model is proposed to achieve optimal scheduling in face of multipleuncertainties. The flexibility of the pumped-storage hydro station is also considered. Third, the solution strategies which linearize the nonlinear terms in the objective function and constraints are introduced. Finally, the correctness and effectiveness of the robust unit commitment model are tested and verified in the modified 39-bus system.

Keywords: Renewable energy source, Hydro station.

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122. Underground Cable Fault Detector BasedOnarduino

Dr.G.Malathy[1], Inbaraj A[2] [1] Professor, [2] UG Students

[1,2]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract

Using an Arduino microcontroller kit, the project aims to detect the location of a problem in subterraneancable lines from the base station to an accurate location in kilometers. In metropolitan areas, instead of overhead lines, electrical cables are run underground. It's difficult to pinpoint the exact position of a fault in an underground wire for the purpose of fixing it.The proposed system identifies the fault's exact location. This system is powered by a rectified power supplyand an Arduino microcontroller kit. The current sensing circuits are interfaced to the Arduino microcontroller kit with the help of the internal ADC device for providing digital data to the microcontroller representing the cable length in kilometers. The fault is created by a set of switches. Therelay driver is in charge of the relays.The information is displayed on a 16x2 LCD display connected to the microcontroller. In the event of a short circuit, the voltage across the series resistors changes, which is then fed to an ADC to generate precise digital data for a programmed Arduino microcontroller kit, which displays the exact fault locationfrom the base station in kilometers. When a fault occurs in a cable, the buzzer sounds an alarm.

Keywords: Arduino Board, Ohms Low, LCD (Liquid Cristal Display), Cable Fault, ADC (Analogue ToDigital Converter), Digital Data. I

123. Transformer Health Monitoring System

Dr.G.Malathy[1] , Manikandan N[1] Professor, [2] UG Students

[1,2]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

Transformers are the main building block in a power system. Any damages in transformer adverselyaffects the balance of a power system. The damages are mainly occurring due to overloading and inefficient cooling. The main objective of the real time monitoring of the health conditions of the distribution transformer using IOT technology.The parameters such as temperature, voltage, current, and oil level of a transformer are monitored, processed and recorded in servers. For this purpose, we use sensors interfaced with Espwroom 32 microcontroller. The recorded data can be send using Wi-Fi module and accessed from anywhere aroundthe world using IOT technology. This helps in identifying human dependency, and solving a problem before a failure without human monitoring.

Keywords: Transformers, Health Conditions, Microcontroller, IOT Technology .

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124. Health Monitoring System By Using Iot

Mr.G.Karthick [1], Sasikumar R[2] [1]Assistant Professor, [2] UG Students

[12]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract

Health has prime importance in our day-to-day life. Sound health is necessary to do the daily work properly. This project aims at developing a system which gives body temperature and heart rate using LM35 and pulse sensor respectively. These sensors are interfaced with controller Arduino uno board. Wireless data transmission done by Arduino through wifi module.ESP8266 is used for wireless data transmission on IoT platform i.e. thing speak. Data visualization is done on Thing speak. So that record ofdata can be stored over period of time .This data stored on web server so that it can seen to who logged.

Keywords—Health monitoring system, controller, pulse sensor, temperature sensor, IOT.

125. Utilization Of Compressed Air Energy Storagethrough Renewable Energy Sources

Mr.G.Karthick [1], Sivakumar P[2]

Abstract:

[1]Assistant Professor, [2] UG Students[12]Indra Ganesan College of Engineering, Manikandam, Trichy

Energy storage has become a matter of great concern in the increasing Renewable Energy (RE) scenario and it plays a vital role in the renewable based micro and nano grids. Among the various energy storage systems, Compressed Air Energy Storage (CAES) system has received the attention of scientists during the recent years due to its long life cycle and the scope and potential of increasing round trip efficiency byintroducing the concept of polygeneration along with other recent inventions in this technology. In the present work, an experimental investigation has been carried out on small capacity CAES system by constructing a 400 L capacity storage tank and the round trip efficiency is quantified by conducting several charging and discharging experiments.

The results reveal that the expander efficiency is 41.79%, 54.25% and 68.3% for the mass flow rates of0.005 kg/s, 0.0075 kg/s and 0.01 kg/s respectively and the roundtrip efficiency was 13.4%, 17.4% and 22.02% for the mass flow rates of 0.005 kg/s, 0.0075 kg/s and 0.01 kg/s respectively.

Keywords :CAES, Renewable energy sources.

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126. SMART SOLAR GRASS CUTTER WITH LAWNCOVERAGE

Mr.G.Karthick [1], Veera ragavan A[2] [1] Assistant Professor, [2] UG Students[2]

Abstract:

The smart grass cutter system puts forth a completely automated lawn mover mechanism. The robotic vehicle is equipped with a grass cutter blade that allows for grass cutting at high RPM. The system has a smart functionality that allows it to cover the complete area of a lawn or garden by detecting corners using ultrasonic sensor and moving in a zigzag manner in order to cover the entire area. This efficient system uses a microcontroller based circuit in order to achieve this functionality. It is a battery operated system that uses 2 batteries. One battery is used to run the vehicle movement DC motors and the other one is used to power the grass cutter motor. Also the system uses a solar panel to demonstrate the charging of vehicle movement battery. The microcontroller operates the vehicle movement dc motors as well as the grass cutter at the same time as monitoring the ultrasonic sensors. The microcontroller smartlyoperates the dc motors using the motor driver IC to achieve desired movement based on ultrasonic inputs.The system also uses a gyro sensor in order to achieve perfect 180 degree turns in order to achieve complete lawn/garden coverage. Thus this systemallows for fully automated grass cutting system withoutthe need for any human intervention

Keywords :
Grass cutter, Microcontroller , Ultrasonic sensors

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127. Controlling Of Star Delta Starter And Automatic Power Factor Improvement UsingArduino For Induction Motor

Mr.A.Richards Rethinasamy [1] , Yuvaraj S [2]

[1] Assistant Professor, [2] UG Students

[12] Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

Star or Delta starters are the most common reduced voltage starters in the 50 Hz industrial motors. They are used in an attempt to reduce the starting current applied to the motor during start. The Star/Delta starter is generally manufactured using three contactors, a timer and a thermal overload for operating a 3- phase motor at 440 volt at AC mains supply of 50 Hz. However, in our project we have taken up the sameto operate a 3-phase motor at 440 volt AC mains supply 50 Hz with a set of 12 volt DC relays an electronically adjustable timer provided through arduino and a set of miniature circuit breakers. The interlocking arrangement of the relay coils and the electronic arduino is all wired in low- voltage DC of 12 Volt fed from an in-built DC power supply for safe handling of the starter during the study, still retaining its application for a 3-phase motor starting with a single phasing prevention.The timer comprisesof Arduino the output of which is fed to a relay for changing the mains supply from 3-phase star to delta. The project also has the provision of single phase protection, since the 3-phase motors may get burnt ifany one phase goes missing during operation. The output to the lamps shall be completely cut off in the event of any phase failure. Furthermore, the project can be enhanced by using thyristors in a firing angle control principle for soft start of the induction motor that would overcome all the drawbacks of the star delta starter.

Keywords: Star – Delta starter, Arduino.

128. Improved Active Power Filter Performancefor Solar And Wind System

Mr.A.Richards Rethinasamy 1,Kumar[2]

[1] Assistant Professor, [2] UG Students

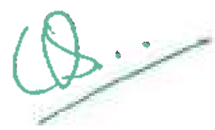
[2] Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

An active power filter implemented with a four-leg voltage-source inverter using a predictive control scheme is presented. The use of a four-leg voltage-source inverter allows the compensation of currentharmonic components, as well as unbalanced current generated by single-phase nonlinear loads.

A detailed yet simple mathematical model of the active power filter, including the effect of the equivalentpower system impedance, is derived and used to design the predictive control algorithm. The compensation performance of the proposed active power filter and the associated control scheme under steady state and transient operating conditions is demonstrated through simulations and experimental results.

Keywords : Power Filter, Solar , Wind



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129. Electric Vehicle Charging Station SlotBooking Using Arduino

Mr.A.Richards Rethinasamy [1], Inbaraj A [2]

[1]Assistant Professor, [2] UG Students

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Abstract:

At present, humans face the problem of lack of fuel and environmental pollution to reduce pollution as well as fuel consumption. We have to use electric vehicles, but the spread of these vehicles is still low dueto the lack of charging stations as well as their high prices. This paper reviews important research about charging stations with IoT and the charging type used in these stations, and it makes a comparison between them, as well as the sources for these stations, which may be renewable and non-renewable energy. Using IoT saves the time spent by the user looking for the stations' location with the possibility ofknowing the location of charging stations by using a mobile application, as well as the possibility of placing charging stations in public places and parking stations, thus making it easier to move to the use ofthese new vehicles. Subject Areas Wireless Communication, Computer Engineering.

Keywords: State Of Charge (SOC), Electric Vehicle, Internet of Things (IoT), Charging Station, BatteryManagement System (BMS), Renewable Energy sources

130. Performance Analysis Of A Control Schemefor Shunt Active Filter As ReactivePower Compensator

Mr.S.Vijai [1], Manikandan N [2]

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Abstract:

Selection of proper reference compensation current extraction scheme plays the most crucial role in the performance of an active power filter (APF). This paper mainly describes three different control schemesused in APFs namely, Conventional instantaneous active and reactive power (p–q), Modified p–q, and Instantaneous active and reactive current component (i_d–i_q) schemes. Our objective here is to bring downthe total harmonic distortion (THD) of source current sufficiently below 5% at the point of common- coupling (PCC), in order to satisfy the IEEE 519-1992 Standard recommendations on harmonic limits.Comparative evaluation of the three control schemes shows that, i_d–i_q method is the best control scheme to be implemented on shunt APFs, irrespective of the supply voltage conditions, even under sudden loadfluctuations. Results have been validated using MATLAB/Simulink simulations followed by real-time performance verification in Opal-RT Lab simulator. Here, the APF is comprised of a voltage source inverter (VSI) based on pulse-width modulation (PWM) technique. Hence, undesirable power loss takesplace inside VSI due to the presence of inductors and frequent switching of IGBTs. This is effectively minimized with inverter DC-link voltage regulation using a PI controller, whose gains are optimized using particle swarm optimization (PSO).

Keywords:THD, Active power filter.

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131. Voltage Quality Identification And Mitigation Using Simple Pi BasedAbc Controlled Dvr In Distribution System

Mr.S.Vijai [1], Sasikumar R[2]

[1]Assistant Professor, [2] UG Students

Abstract:

Dynamic voltage restorer (DVR) is a power electronics based custom power device (CPD) which is used In distribution system to mitigate voltage sag problem, although the performance of DVR depends mainlyon its control technique. In this paper, a synchronous reference frame (SRF) theory based versatile controltechnique is presented for DVR to mitigate voltage sag problem for sensitive loads in distribution system.The DVR is connected with the load bus in series through injection transformer and filter combination.

To improve sag detection in DVR a fuzzy logic based automatic switch is introduced. Proposed control technique has capability to settle balanced as well as imbalanced sag. An efficient strategy to regulate DC link capacitor voltage of DVR is also presented In this paper. Performance of DVR with the proposedcontrol technique is evaluated using Matlab/Simulink. Simulation results show the effectiveness of proposed control technique for DVR to settle voltage sag.

Keywords

Dynamic voltage restorer (DVR),Synchronous reference frame (SRF),Fuzzy logic ,Distribution system

132. Srf Control Algoritam Based DvrFormitigation Balanced And Unbalancedvoltage Disturbances

Mr.S.Vijai [1], Sivakumar P[2] [1]Assistant Professor, [2] UG Students

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Abstract:

The growth of power electronic technology in the field of electric power sector has caused a greater awareness on the power quality of distribution systems. With the re-structuring of power systems and with shifting trend towards distributed and dispersed generation, the issue of power quality is going to take newer dimensions. The present research is to identify the prominent concerns in this area and hencethe measures that can enhance the quality of power. This paper investigates the problems of voltage sag,swell and its severe impact on nonlinear loads, sensitive loads.Protection of the sensitive unbalanced nonlinear loads from sag/swell, distortion, and unbalance in supply voltage is achieved economically using the dynamic voltage restorer (DVR).DVR is installed between supply and load which will inject voltage and active power to the distribution system during balanced/unbalanced voltage sag and swell disturbances. The control technique used to operate the DVR is SRF Theory with Proportional Integral (PI) controller. The performance of DVR based Synchronous reference frame theory (SRF)

Key words: Synchronous Reference Frame Theory (SRF), Balanced and Un Balanced Voltage.

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133. Uninterrupted Power Supply To Load FromDifferent Sources By Using Plc

Mr.S.Ponmathi Rajithkumar [1], Veera ragavan A[2]

[1]Assistant Professor, [2] UG Students

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Abstract:

The main purpose of this project is to provide continuous power supply to a load, by selecting the supply from any of the four sources namely AC mains and solar, wind, and hydro automatically in case if one thesource is absent. The need of electricity is increasing day by day and the frequent power cuts of electricityare causing many problems in different areas like banks, colleges/schools, hospitals, houses and industries. Thus there is requirement for an alternate arrangement of power supply. When a source, say mains fails, the supply automatically shifts to next priority source.

On failure of the mains supply the load gets supply from the next available source, say an inverter. If the inverter also fails it switches over to the next available source and so on. As it is not feasible to provide allthree different sources of supply, one source with alternate switches are provided to get the same function.The complete switching operation can be controlled by using the plc. The sources which are not delivering the power to the load are given to micro grid and BESS (Battery Energy Storage System)

Keywords: PLC, Sources, BESS, Micro Grid

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134. Voltage Disturbance Mitigation UsingPso Based Dvr Controller In Simplified Frame Indistribution Systems

Mr.S.Ponmathi Rajithkumar[1], Yuvaraj S[2]

[1] Assistant Professor, [2] UG Students

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Abstract:

In the distribution power system, voltage sag and swell are the critical issues. The impact of this issue creates major economic loss and power loss in the distribution system. There are several detection methods available, mainly, connecting the FACTS devices such as Static Compensator (STATCOM), Unified Power Quality Conditioner (UPQC), and dynamic voltage restorer (DVR) at the point of sag or swell. DVR is one of the custom power devices to mitigate the voltage sag and swell. Sliding mode controller (SMC) is proposed in the paper, which is used to regulate the DVR to mitigate the voltage sagissue. Particle swarm optimization (PSO) algorithm is utilized in this work to find the optimum value of SMC parameters, namely, K_p and K_i, with the objective of minimizing the integral square error (ISE). A simple two feeder distribution network with DVR is developed in MATLAB-SIMULINK to assess the performance of DVR under various faults and disturbed situations. The mitigation level and THD valuesof PSO-optimized SMC-based DVR results are compared with the PI controller-based DVR, PSO- optimized PI controller DVR, and SMC-based DVR. At last, in the proposed method, the trial is taken byadding a renewable energy resource, that is, PV farm at 400-kW power rating. The solar energy is integrated with the existing distribution system, and the results are incorporated. Simulation results showthat the PSO-optimized SMC-based DVR can compensate the voltage sag and swell and also reduce the load voltages efficiently.

Keywords: PSO, Sliding mode controller, PSO.

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135. Power Generation On Highway By UsingVertical Axis Wind Turbine With Solar Systems

Mr.S.Ponmathi Rajithkumar [1], Arun praveen raj A[2]

[1]Assistant Professor, [2] UG Students

[12]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

This paper focuses on use of air on highway divider with the help vertical axis wind turbine. When the vehicle passed on the highway it produces a considerable amount of air due to its speed. This air tangentially strikes on the blade of the vertical axis wind turbine and its makes a rotation of the turbine in only one direction. The solar system is used to generate electrical energy and also installed in a way that itdiverts the vehicle air towards the turbine. The generator with the gear mechanism is connected to the shaft of the vertical axis wind turbine to generate electricity. The electrical output of vertical axis turbine and the solar system is stored in a battery. This stored energy which can be further used for street lighting,toll gates, etc.
Key Words: vertical axis Turbine Design, renewable energy source, battery system, solar plates, Highwaymedium.

136. Automatic Bottle Filling By Using Plc

Mr.D.Praveen Sangeethkumar [1], Inbaraj A[2]
[1]Assistant Professor, [2] UG Students
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Abstract

The objective of our project is to design, develop and monitor "Automatic bottle filling system using PLC". This work provides with a lot of benefits like low power consumption, low operational cost, less maintenance, accuracy and many more. This project is based on Industrial automation and is a vast application used in many industries like milk industries, chemical, food, mineral water and many industrial manufacturers. A prototype has been developed to illustrate the project. Filling is the task that iscarried out by a machine and this process is widely used in many industries. In this project, the filling of the bottle is controlled by using a controller known as PLC which is also the heart of the entire system.For the conveyor system, a dc motor has been selected for better performance and ease of operation. A sensor has been used to detect the position of the bottle. In our project we have used less number of system hence the overall cost has been reduced to an extent. Ladder logic has been used for the programming of the PLC, which is the most widely used and accepted language for the programming ofthe PLC. The PLC used in this system is a Siemens S7 1200 which makes s the system more flexible and easy to operate

Keywords :

PLC, Ladder Logic

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137. Agri City- The Contrivance OfHarvestingelectricity

Mr.D.Praveen Sangeethkumar [1], Manikandan N[2]

[1]Assistant Professor, [2] UG Students
[12]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract

The issue of how to power the deployed Internet of Things (IoT) nodes with ubiquitous and long lasting energy in order to ensure uninterruptible optimization of smart cities is of utmost concern. This among other challenges has continued to gear efforts toward energy harvesting research. With the outbreak of COVID-19 pandemic and the lockdown that nearly paralyzed activities of everyday living in many nations of the world, option of human remote interaction to enforce social distancing became imperative. Hence, the world is witnessing a renewed awareness of the importance of IoT devices, as integral components of smart city, especially for the essence of survival in the face of lockdown.

Energy harvesting is a possible solution that could enable IoT nodes to scavenge self-sustaining energy from environmental ambient sources. In this paper, we have reviewed most sources within city that energy could be harvested from, as reported by researchers in literature. In addition, we have submitted that energy sources can be application specific, such that, since there are many free sources in the city as presented in this review, energy should be scavenged within close proximity of need for various IoT devices or wireless sensor networks (WSNs), for smart city automation.

Keywords: COVID-19 pandemic; energy harvesting; IoT; smart city; WSNs

138. Design And Control Of InterfacingConverters For Wind And Wave Energy Generation- A Dc Micro Grid Approach

Mr.D.Praveen Sangeethkumar [1], Sasikumar R[2]

[1]Assistant Professor, [2] UG Students
[2]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

In order to study the uncertainty and intermittent characteristics of wind power and wave power, this paper proposes an integrated wind and wave power generation system fed to an ac power grid or connected with an isolated load using a dc microgrid. The proposed dc microgrid connects with a wind power generator through a voltage-source converter (VSC), a wave power generator through a VSC, an energy storage battery through a bidirectional dc/dc converter, a resistive dc load through a load dc/dc converter, and an ac power grid through a bidirectional grid-tied inverter. The studied integrated wind andwave system joined with the dc microgridis modeled and simulated using the written program based on MATLAB/Simulink. Root-loci plots of the studied system under various speeds of the wave generator areanalyzed. To examine the fundamental operating characteristics of the studied integrated system joined with the dc microgrid, a laboratory-scale platform is also established. Comparative simulation and

Keywords: Microgrid, VSC , Matlab

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139.A Pv-Statcom For Enhancement Of Power Quality In Grid Integrated System Using Unit Vector Controller

Mr.B.ArunPandiyan[1], Sivakumar [1]Assistant Professor,[2] UG Students

[12]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:
Utilisation of Renewable Energy sources have been increasing exponentially to reach the world power demand. Less utilization of rating of power converters in renewable energy system forces the researchers to develop new applications like power quality improvement. Power pollution is the key problem becauseof distorting or non-linear loads and distributed generation. The major power quality issues like wave form distortions (harmonics) and reactive power demand can be completely neutralized by the Custom power devices like Statcom. In this paper PV Solar Farm is performing as a PV-Statcom to elevate qualitative power in Grid coalesced Wind-PV system. The PV-Statcom control strategy results amplification of power quality. The results are obtained using Matlab/Simulink. The effectiveness of present concept gesture towards that improvement in PF and reduction of THD values.

Keywords: PV system. Vector controller , MATLAB.

140. Modelling And Optimal Control Of TwoLinkplanar Arm

Mr.B.ArunPandiyan[1], Veera ragavan A[2] [1] Assistant Professor, [2] UG Students

[12]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

This paper focuses on the modelling and control of a two-link planar arm that emulates a human arm. The system model derived both in the 2nd -order differential equation formulation and state-variableformulation, the system is linearized around equilibrium point for analysis. The arm is subjected to a disturbance at a specific location on the arm while performing trajectory tracking tasks in two dimensional space. A closed-loop control system is applied using LQR control to observe the system responses like state tracking, position and velocity control. These results of the study show the effectiveness of the proposed method in eliminating the unwanted disturbance effect to produce robust position, velocity and accurate tracking performance of the system.

Keywords : -Lagrange's equation. Modelling, Linearization, Linear Quadratic Regulator, State tracking.

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141. Impedance Source Inverter Fed PermanentMagnet Bldc Motor

Mr.B.ArunPandiyan[1], Yuvaraj S[2] 1 Assistant Professor, 2 UG Students

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Abstract:

The operation principle, the modeling method and the control are all different from the Z-source inverter- based ASD system with induction machines. According to the operation principle of BLDC motor, two phases are conducted in the non-commutation stages.The operation principle, the modeling method and the control are all different from the Z-source inverter based ASD system with induction machines. According to the operation principle of BLDC motor, two phases are conducted in the non-commutation.

Keywords: ASD, BLDC motor, VSI

142. Mitigating The Power Quality Issue UsingIupqc

Mr.K. Seetharaman[1], Arun praveen raj[2] 1 Assistant Professor, 2 UG Students

1,2 Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

Renewable energy integration introduces grid instability due to variable and intermittent sources like solarand wind, impacting reliability. This paper provides a thorough discussion of recent advancements and emerging trends in grid-integrated wind energy systems (GIWES) and grid-integrated solar energy systems (GISES). More than 70 research articles have been rigorously assessed and listed the technological and economic challenges. The increase in installations of grid-Integrating systems gives riseto challenges like as grid strain, peak shaving impacts, unpredictability of renewable energy sources (RES), and power quality disturbances. A variety of custom power devices, such as dynamic voltage restorers (DVR), static synchronous compensators (STATCOM), active power filters (APF), and unified power quality conditioners (UPQC), have gained popularity in response to these challenges. Among the various challenges, power quality disturbances, including voltage sag, swell, current and harmonics pose significant issues. To address these disturbances this work present a novel approach utilizing fuzzy logic (FL) to develop multi-feeder interline unified power-quality conditioners (MF-IUPQCs). The MF-IUPQChas three legs and three levels, each of which has four diode-clamped inverters.

Switching is carried out through the use of space vector pulse width/duration modulation (SVPWM). Total harmonic distortion (THD) induced by nonlinear loads is reduced by the FLC-based MF-IUPQC, which also improves dynamic performance and offers a smooth DC-link voltage. The proposed control mechanism is implemented using MATLAB/Simulink. The fuzzy-based controller is compared to the industry-standard proportional-integral (PI) controller to determine its efficacy. Among them, the MF-IUPQC based on FLC delivers the smoothest voltage profile and the lowest THD.

Keywords : GISES, THD , Matlab Siulink ,

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143. Load Balancing Of Feeder Using FuzzyAndoptimization Technique

Mr.K. Seetharaman[1], Inbaraj A[2] Assistant Professor, [2] UG Students

Abstract:

Phase balancing generally occurs during minimization of loss, planning and restoration of energy in distribution systems. Some areas may be over loaded due to fault in distribution. In order to overcome these problems, power controlling and there by controlling of load is required for those areas. It leads toload balancing technique. In these papers, load balancing is achieved by fuzzy logic control. Input to thefuzzy is the total load of the feeders. The output of the fuzzy step is the input to the load balancing system. Load balancing system utilizes optimization technique to convert kilowatts values into load points and specify the load points.

Keywords: Load balancing, fuzzy logic, feeder, optimization and MATLAB

144. Practical Oriented Foot Step Electric Powergeneration By Using Piezo Material AndMicrocontroller In Campus

Mr.K. Seetharaman[1], Manikandan N[2] [1]Assistant Professor, [2] UG Students

[12]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

The decrease in energy consumption of portable electronic devices, the concept of harvesting renewable energy in human surrounding arouses a renewed interest. This technical paper focuses on one such advanced method of energy harvesting using piezoelectric material. Piezoelectric materials can be used asmechanisms to transfer mechanical energy, usually ambient vibration, into electrical energy that can be stored and used to power other devices. A piezoelectric substance is one that produces an electric charge when a mechanical stress is applied. Conversely, a mechanical deformation is produced when an electric field is applied. Piezo-film can generate enough electrical density that can be stored in a rechargeable battery for later use. Piezoelectric materials have a vast application in real fields. Some of the latest applications are mentioned below. Currently, there is a need to utilize alternative forms of energy at passenger terminals like airports and railways across the world. Cleaner, more sustainable forms of electrical power are needed in order to keep costs lower, to maintain positive and productive relationshipswith neighbors and to insure a healthier environment for future generations. The use of piezoelectric devices installed in terminals will enable the capturing of kinetic energy from foot traffic. This energy canthen be used to offset some of power can be used to operate lighting systems. In last few years low powerelectronic devices have been increased rapidly. The devices are used in a large number to comfort our daily lives.
With the increase in energy consumption of these portable electronic devices, the concept of harvesting alternative renewable energy in human surroundings arise a new interest among us. In thisproject I try to develop a piezoelectric generator. That can produce energy from vibration and pressure available on some other term (like people walking). This project describes the use of piezoelectric materials in order to harvest energy from people walking vibration for generating and accumulating theenergy.

Key Words: Piezoelectric material, battery, external pressure, led, microcontroller

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145. Design Of Transformer Peripherals ByComputer Aided Design Drafting

Mr.G.Palanisamy 1,Sasikumar R[2] [1] Assistant Professor, [2] UG
Students
[12]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

Computer Aided Design and Drafting (CADD), is the use of computer technology for design and designdocumentation. CAD software replaces manual drafting with an automated process. Electrical Transformer is a static device which is used to transform the electricity from primary winding to secondary winding without change in frequency and power.

A three phase 100 KVA distribution transformer is designed in AUTOCAD mechanical by using particular dimensions.Power-100KVA,Primary Voltage-11KV,Primary Current-5A,Secondary Voltage-415V, Secondary Current-139A, which are derived by substituting the primary voltage, primary current,secondary voltage and secondary current in specific formulae to find out the calculations like core area, window area, stack height, limb width, and gross core area. By using these calculations in the basic levelthe length breadth and height of the core is calculated accurately which are utilized to make perfect design.

Keywords: CAD, Distributed Transformer

146. Multi Level Statcom Using Two LevelInverters

Mr.G.Palanisamy[1], Sivakumar P[2] [1] Asistant Professor, [2] UG
Students

[12]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

In this paper, a simple static var compensating scheme using a cascaded two-level inverter-based multilevel inverter is proposed. The topology consists of two standard two-level inverters connected in cascade through open-end windings of a three-phase transformer. The dc-link voltages of the inverters areregulated at different levels to obtain four-level operation.The simulation study is carried out in MATLAB/SIMULINK to predict the performance of the proposed scheme under balanced and unbalanced supply-voltage conditions. A laboratory prototype is developed tovalidate the simulation results. The control scheme is implemented using the TMS320F28335 digital signal processor. Further, stability behavior of the topology is investigated. The dynamic model is developed and transfer functions are derived. The system behavior is analyzed for various operating conditions.

Keywords :Multilevel Inverter, MATLAB ,static var

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147. High Speed Operation Of BldcMotor Employing Novel ControlTechniques

Mr.G.Palanisamy[1], Veera ragavan A[2]

[1]Assistant Professor, [2]UG Students

[1,2]Indra Ganesan College of Engineering, Manikandam, Trichy

Abstract:

In this paper, a novel drive method, which is different from the traditional motor drive techniques, for high-speed brushless DC (BLDC) motor is proposed and verified by a series of experiments. It is well known that the BLDC motor can be driven by either pulse-width modulation (PWM) techniques with a constant dc-link voltage or pulse-amplitude modulation (PAM) techniques with an adjustable dc-link voltage. However, to our best knowledge, there is rare study providing a proper drive method for a high-speed BLDC motor with a large power over a wide speed range. Therefore, the detailed theoretical analysis comparison of the PWM control and the PAM control for high-speed BLDC motor is first given.Then, a conclusion that the PAM control is superior to the PWM control at high speed is obtained because of decreasing the commutation delay and high-frequency harmonic wave. Meanwhile, a new high-speed BLDC motor drive method based on the hybrid approachcombining PWM and PAM is proposed. Finally, the feasibility and effectiveness of the performance analysis comparison and the new drive method are verified by several experiments.

Keywords:

BLDC, Pulse width modulation

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148. Chart classification: an empirical comparative study of different learning models

Dr. Kavitha N, IT, ProfessorJanani S , Deepa T, IT, UG Student

Abstract:

This research conducts an empirical comparative study of different learning models for chart classification, a crucial task in data analysis and visualization. The study aims to evaluate and compare the performance of various machine learning and deep learning models in accurately classifying different types of charts commonly used in data representation.

The research involves implementing and testing several learning models, including traditional machine learning algorithms and deep learning architectures, on a diverse dataset of charts. Performance metrics such as accuracy, precision, recall, and F1 score are used to assess the models' effectiveness in classifying bar charts, line charts, pie charts, etc.

The outcomes of this research contribute to a comprehensive understanding of the strengths and weaknesses of different learning models in the context of chart classification. This knowledge can guide the selection of appropriate models for specific chart recognition tasks in data analysis applications.

Keywords: Chart Classification, Machine Learning, Deep Learning, Data Analysis, Visualization, Comparative Study, Performance Metrics.

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149. ATPG for Incomplete Testing of SOC Considering Bridging Faults

Dr. Nancy V, IT, Associate Professor Irudhayaraj A., IT, UG

Student

Abstract:

This research addresses the challenge of Incomplete Testing in Systems-on-Chip (SoC) through the development of an Automatic Test Pattern Generation (ATPG) technique that considers bridging faults. Incomplete testing can leave undetected faults in the SoC, compromising its reliability. The study focuses on enhancing test coverage by incorporating the detection of bridging faults in the ATPG process.

The proposed ATPG technique involves the identification and generation of test patterns specifically tailored to detect bridging faults in the SoC. Through simulations and experimental evaluations on diverse SoC architectures, the research assesses the effectiveness of the ATPG technique in improving test coverage and detecting previously undetected faults.

The outcomes of this research contribute to the advancement of testing methodologies for SoCs, providing an ATPG solution that addresses the challenge of incomplete testing by considering and detecting bridging faults.

Keywords: ATPG, Incomplete Testing, SOC, Bridging Faults, Test Coverage, Fault Detection, Testing Methodologies.

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150. Natural Walking Speed Prediction in Virtual Reality While Using Target Selection-based Locomotion

Dr. Uthra Devi K, IT, Associate Professor Dharshini K . IT, UG Student

Abstract:

This research focuses on predicting natural walking speed in virtual reality (VR) environments, specifically when users employ target selection-based locomotion techniques. Predicting user walking speed is crucial for enhancing VR experiences and optimizing locomotion interfaces. The study aims to develop a model for accurately predicting natural walking speed in VR scenarios where users utilize target selection-based locomotion.

The proposed approach involves collecting data on user interactions, target selections, and walking speeds during VR experiences. Machine learning models, such as regression algorithms, are trained using this data to predict walking speeds based on user behavior and interaction patterns. The research evaluates the accuracy and generalizability of the prediction model through extensive testing and validation.

The outcomes of this research contribute to the improvement of VR locomotion interfaces, providing a predictive model that enhances the naturalness and user comfort in VR experiences utilizing target selection-based locomotion.

Keywords: Virtual Reality, Locomotion, Walking Speed Prediction, Target Selection, Machine Learning, User Interaction, VR Experiences.

151. A Defense Method Against Facial Adversarial Attacks

Mrs. Saroja Devi S, IT, Assistant Professor Harish R , IT, UG Student

Abstract:

This research proposes a defense method against facial adversarial attacks, which aim to deceive facial recognition systems. Facial adversarial attacks manipulate facial images with imperceptible perturbations to mislead recognition algorithms. The study focuses on developing a defense mechanism to enhance the robustness of facial recognition systems against such attacks.

Keywords: Virtual reality,Machine Learning,User Interaction,VR Experiences

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152. Packet Header Attack by Hardware Trojan in NoC based TCMP and its Impact Analysis

Mr. Devan D P, IT, Associate Professor Kayalvizhi.B , Gopi U, IT, UG Student

Abstract:

This research investigates the potential threat of packet header attacks by Hardware Trojans in Network-on-Chip (NoC) based Temporal Cloaking Message Passing (TCMP) protocols and analyzes their impact on communication security. NoC architectures play a crucial role in on-chip communication, and TCMP protocols enhance security by providing temporal cloaking for message passing. However, Hardware Trojans pose a risk to the integrity and confidentiality of communication.

The study focuses on modeling and simulating packet header attacks facilitated by Hardware Trojans in the context of NoC-based TCMP protocols. The research assesses the impact of these attacks on communication security, including message integrity, confidentiality, and overall system reliability.

The outcomes of this research contribute to understanding the vulnerabilities of NoC-based TCMP protocols to Hardware Trojan attacks, providing insights into potential security enhancements and countermeasures to mitigate these threats.

Keywords: Packet Header Attack, Hardware Trojan, NoC, TCMP, Communication Security, Message Integrity, Confidentiality, Impact Analysis.

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153. Selective Fault-Masking for Improving Yield and Performance of On-Chip Networks

Mrs. Karthiga M, IT, Assistant Professor Janarthanan , IT, UG Student

Abstract:

This research proposes a Selective Fault-Masking technique to enhance the yield and performance of on-chip networks. On-chip networks are susceptible to faults that can affect communication reliability and performance. The study focuses on developing a fault-masking approach that selectively identifies and mitigates faults in critical components of the network, thereby improving overall yield and performance.

The proposed technique involves monitoring network components, identifying potential faults, and applying selective fault-masking mechanisms to mitigate the impact on critical communication paths. Through simulations and performance evaluations, the research assesses the effectiveness of Selective Fault-Masking in terms of improving network yield and maintaining reliable communication.The outcomes of this research contribute to the optimization of on-chip network reliability and performance ,providing a Selective efficient communication in the presence of faults.

Keywords: Selective Fault-Masking, On-Chip Networks, Yield Improvement, Performance Optimization, Fault Mitigation, Communication Reliability.

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154. Formal Modeling and Verification of Starvation-Freedom in NoCs

Mrs. Starlin M A, IT, Assistant Professor Kamalesh A , IT, UG Student

Abstract:

This research focuses on the formal modeling and verification of starvation-freedom in Network-on-Chips (NoCs), critical components in parallel and distributed computing systems. Starvation-freedom ensures equitable resource access for processing elements within the NoC, preventing any element from being indefinitely denied access to vital resources. The study employs formal methods, specifically Temporal Logic of Actions (TLA+), to construct a mathematical model of the NoC and rigorously specify properties, emphasizing starvation-freedom. The chosen model checker explores the state space to verify the absence of starvation scenarios. Counterexample analysis informs iterative refinements of the model and property specifications. The research contributes to the assurance of robust, fair, and predictable behavior in NoCs, enhancing the reliability of distributed systems.

Keywords:

Formal Modeling,Verification,Network-on-Chip (NoC),Starvation-Freedom,Temporal Logic of Actions (TLA+),Formal Methods,Parallel Computing,Distributed Systems,Resource Allocation, Counterexample Analysis

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155. Machine Learning for VLSI CAD: A Case Study in On-Chip Power GridDesign

Mrs. Jenila S, IT, Assistant Professor Sivaranjani P, IT, UG Student

Abstract:

This study presents a comprehensive exploration of the application of machine learning techniques in the field of Very Large Scale Integration (VLSI) Computer-Aided Design (CAD), with a specific case study in on-chip power grid design. Power grid design is a critical aspect of VLSI circuitry, influencing performance, reliability, and energy efficiency. The research leverages machine learning algorithms to automate and optimize the power grid design process. A dataset comprising diverse VLSI layouts and corresponding power grid configurations is used for training and validation. The machine learning model learns patterns, correlations, and design heuristics, facilitating efficient power grid synthesis. The study demonstrates the feasibility and effectiveness of machine learning in enhancing the design automation of on-chip power grids, contributing to accelerated VLSI CAD methodologies.

Keywords: Machine Learning,VLSI CAD,On-Chip Power Grid,Design Automation,Very Large Scale Integration (VLSI),Circuit Layout,Energy Efficiency,Pattern Recognition,Optimization,Design Heuristics

156. Challenges in Chart Image Classification: A Comparative Study of Different DeepLearning Methods

Mrs. Himagiri Sudha S, IT, Assistant Professor Manoharan T , IT, UG Student

Abstract:

Chart image classification is a complex task with applications in diverse fields such as data analysis, finance, and scientific research. This study conducts a comparative analysis of various deep learning methods to address challenges inherent in chart image classification. Challenges include diverse chart types, varying scales, and the need for robust feature extraction. The research evaluates the performance of Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and Transformer-based models on a benchmark dataset. Challenges specific to each method are identified and discussed, shedding light on their strengths and limitations in the context of chart image classification. The findings contribute valuable insights for selecting appropriate deep learning approaches based on the nature of the chart data.

Keywords: Chart Image Classification,Deep Learning,Convolutional Neural Networks (CNNs)Recurrent Neural Networks (RNNs),Transformers,Feature Extraction,Comparative Study,Benchmark Dataset,Data Analysis,Image Recognition.

157. Semi-Supervised Deep Learning for Multiplex Networks

Mrs. Saroja Devi S, IT. Assistant Professor Meena R , IT, UG Student

Abstract:

Multiplex networks, characterized by interconnected layers of diverse relationships or interactions, pose unique challenges for effective representation and analysis. This study explores the application of semi-supervised deep learning techniques for multiplex network analysis. Leveraging the inherent structure of multiplex networks, the proposed model integrates both labeled and unlabeled data to enhance node classification performance. We extend traditional deep learning architectures to accommodate multiplex structures, allowing the model to capture intricate relationships across layers. The research demonstrates the efficacy of the proposed semi-supervised approach on benchmark datasets, showcasing improved accuracy in node classification tasks within multiplex networks. This work contributes to advancing the understanding and utilization of deep learning methodologies in the context of complex interconnected systems.

Keywords: Semi-Supervised Learning,Deep Learning,Multiplex Networks,Interconnected Layers,Node Classification,Graph Representation Learning,Complex Systems,Network Analysis,Unlabeled Data

158. Feature Selection using Pre-clustering via Affinity Propagation for SpeechClassification inLow-resource Languages

Dr.M. Senthilkumar, Professor, Department of CSE, M.A.M. School of Engineering .

Abstract:

Speech classification in low-resource languages presents unique challenges, often exacerbated by the scarcity of labeled data. This study introduces a novel approach for feature selection using pre-clustering via Affinity Propagation (AP) to address these challenges. The proposed method leverages the unsupervised nature of AP to identify informative clusters in the feature space, accuracy with limited labeled data. This research contributes to the development of robust speech classification models for languages with constrained linguistic resources.

Keywords: Feature Selection,Pre-clustering,Affinity Propagation,Speech Classification,Low-resource Languages,Unsupervised Learning,Dimensionality Reduction,Supervised Learning,Labeled Data,Linguistic Resources

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159. LPECN: Leveraging PIT placement and Explicit marking for Congestion control inNDN

Mrs. Karthiga M, IT, Assistant Professor Pavithra.N , IT, UG Student

Abstract:

Named Data Networking (NDN) represents a paradigm shift in network architectures by focusing on content-centric communication. However, congestion control in NDN remains a challenging aspect. This research proposes a novel approach, Leveraging PIT (Pending Interest Table) Placement and Explicit Marking for Congestion Control in NDN (LPECN). LPECN introduces strategic PIT placement mechanisms to better manage incoming Interest packets and employs explicit marking to signal and alleviate congestion proactively. The study evaluates LPECN's performance through simulations and compares it with existing congestion control strategies. Results demonstrate that LPECN effectively improves network throughput, reduces packet loss, and enhances overall congestion management in NDN environments.

Keywords: Named Data Networking (NDN),Congestion Control,PIT Placement,Explicit Marking,Networking Architecture,Interest Packets,Network Throughput,Simulation,Network Performance,Content-Centric Communication.

160. Towards Layer-wise Optimization of Contextual Neural Networks with ConstantField ofAggregation

Mrs. Starlin M A, IT, Assistant Professor Milton Billgates J , IT, UG Student

Abstract:

Contextual neural networks have proven effective in various tasks, but their optimization and computational efficiency remain crucial challenges. This research introduces a novel approach towards layer-wise optimization of contextual neural networks, specifically focusing on achieving a constant field of aggregation. By optimizing the receptive field at each layer, the proposed method aims to enhance the network's computational efficiency and overall performance. The study includes a detailed analysis of the proposed technique through experiments on benchmark datasets, showcasing its potential for improving the convergence rate and reducing computational overhead. This work contributes to the ongoing efforts to make contextual neural networks more efficient and applicable in resource-constrained scenarios.

Keywords Contextual Neural Networks,Layer-wise Optimization,Computational Efficiency,Receptive Field,Constant Field of Aggregation,Neural Network Optimization,Convergence Rate,Benchmark Datasets,Resource-constrained Scenarios,Machine Learning.

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161. LIENE: Lifetime Enhancement for 6LoWPAN Network Using Clustering Approach Usecase: Smart Agriculture

Mrs. Jenila S, IT, Assistant Professor **Kaviyarasu C , IT, UG Student**

Abstract:

In the context of smart agriculture applications, the widespread deployment of 6LoWPAN (IPv6 over Low-Power Wireless Personal Area Networks) faces challenges related to the limited energy resources of sensor nodes. This research introduces a novel approach, referred to as Lifetime Enhancement for 6LoWPAN Network Using Clustering Approach (LIENE), aimed at mitigating the energy constraints in such networks. LIENE employs a clustering strategy to organize sensor nodes, effectively reducing communication overhead and extending the overall network lifetime. Through simulations conducted in a smart agriculture use case scenario, LIENE demonstrates notable improvements in energy efficiency, network longevity, and data reliability. This research establishes LIENE as a promising solution for enhancing the sustainability and operational duration of 6LoWPAN networks in resource-constrained agricultural environments.

Keywords: 6LoWPAN,Smart Agriculture,Network Lifetime,Clustering Approach,Energy Efficiency,Sensor Nodes,IoT (Internet of Things),Communication Overhead,Network Longevity,Data Reliability.

162. Speech Recognition for Indian spoken languages towards Automated Homeappliances

Dr. Kavitha N, IT, Professor Mohammed Aarif J , IT, UG Student

Abstract:

This research addresses the need for effective speech recognition systems tailored for Indian spoken languages, with a focus on enabling automation in home appliances. Recognizing the linguistic diversity in India, the study proposes a robust Speech Recognition for Indian Spoken Languages (SRISL) system. Leveraging deep learning techniques and incorporating language-specific features, SRISL aims to accurately transcribe spoken commands in various Indian languages. The developed system is integrated into a prototype for automated home appliances, showcasing its practical application. Through extensive evaluations on diverse linguistic datasets, SRISL demonstrates promising accuracy and usability, paving the way for improved human-machine interaction in smart home environments.

Keywords: Speech Recognition,Indian Spoken Languages,Home Automation,Deep Learning,Linguistic Diversity,Human-Machine Interaction,Automated Home Appliances,Natural Language Processing,Multilingual Speech Recognition,Smart Home Technologies.

ISBN:978-81-970087-7-1

163. ML for IEEE 802.15.4e/TSCH: Energy Efficient Approach to Detect DDoS AttackUsingMachine Learning

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Abstract:

The IEEE 802.15.4e standard, particularly Time-Slotted Channel Hopping (TSCH) mode, is widely employed in low-power and time-sensitive wireless communication networks. However, these networks are vulnerable to Distributed Denial of Service (DDoS) attacks that can severely impact energy efficiency. This research proposes a Machine Learning (ML) based approach for detecting DDoS attacks in IEEE 802.15.4e/TSCH networks, with a specific emphasis on preserving energy efficiency. By leveraging ML algorithms for anomaly detection, the system identifies malicious activities and mitigates their impact on network resources. The proposed approach is evaluated through simulations, demonstrating its effectiveness in accurately detecting DDoS attacks while maintaining energy-efficient operation in TSCH-based networks.

Keywords: Machine Learning,IEEE 802.15.4e/TSCH,Energy Efficiency,DDoS Attack Detection,Wireless Communication Networks,Time-Slotted Channel Hopping,Anomaly Detection,Network Security,Low-Power Networks,Simulation-based Evaluation.

164. Real-Time Detection and Localization of Denial-of-Service Attacks inHeterogeneousVehicular Networks

Dr. Uthra Devi K, IT, Associate Professor Shalini Gayathri S , IT, UG Student

Abstract:

Heterogeneous Vehicular Networks (HVN) play a pivotal role in modern transportation systems, relying on seamless communication for enhanced safety and efficiency. However, the dynamic nature of vehicular environments exposes these networks to security threats, including Denial-of-Service (DoS) attacks. This research presents a real-time approach for the detection and localization of DoS attacks in HVN. By leveraging advanced anomaly detection techniques and vehicular localization data, the proposed system identifies malicious activities promptly and pinpoints their origin within the network. The efficacy of the approach is validated through simulations, demonstrating its potential to enhance the resilience of HVNs against DoS attacks in real-time scenarios.

Keywords: Vehicular Networks,Denial-of-Service Attacks,Real-Time Detection,Anomaly Detection,Localization,Heterogeneous Networks,Transportation Systems,Network Security,Simulation,Resilience.

ISBN:978-81-970087-7-1

165. HMDS: A Makespan Minimizing DAG Scheduler for Heterogeneous DistributedSystems

Mrs. Himagiri Sudha S, IT, Assistant Professor Selvi M . IT, UG Student

Abstract:

Efficient scheduling of Directed Acyclic Graphs (DAGs) on Heterogeneous Distributed Systems (HDS) is crucial for optimizing resource utilization and minimizing task completion time. This research introduces HMDS, a novel scheduler designed to minimize makespan in heterogeneous environments. HMDS employs advanced heuristics to make informed decisions regarding task allocation and execution order, considering the diverse computational capacities of heterogeneous nodes. Through extensive simulations and comparisons with existing schedulers, HMDS demonstrates superior performance in terms of makespan reduction, showcasing its potential for enhancing the efficiency of computation-intensive applications in Heterogeneous Distributed Systems.

Keywords: Makespan Minimization,DAG Scheduler,Heterogeneous Distributed Systems,Task Scheduling,Directed Acyclic Graphs,Resource Utilization,Computational Efficiency,Heuristics,Simulation,Task Allocation.

166. Reverse Engineering Register to Variable Mapping in High-Level Synthesis

Mrs. Karthiga M, IT, Assistant Professor Sivaraman S , Suganya K, IT, UG Student

Abstract:

High-Level Synthesis (HLS) tools play a crucial role in converting abstract hardware descriptions into RTL (Register-Transfer Level) implementations. However, understanding the mapping between registers and variables in the generated RTL is essential for effective design exploration and optimization. This research addresses the challenge of reverse engineering the register-to-variable mapping in HLS-generated code. By analyzing the generated RTL and employing static analysis techniques, the proposed method aims to reconstruct the original variable-level information. The effectiveness of the approach is demonstrated through case studies and comparisons with existing techniques, providing valuable insights for designers and researchers involved in HLS and hardware reverse engineering.

Keywords: High-Level Synthesis (HLS),Reverse Engineering,Register-Transfer Level (RTL),VariableMapping,Hardware Description,Static Analysis,Design Exploration,Optimization,RTL Generation,Hardware Reverse Engineering.

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167. An Adaptive and Dynamic Allocation of Delay-sensitive Vehicular Services inFederatedCloud

Mrs. Starlin M A, IT, Assistant Professor Priyanka A , Dhanalaxmi.K, IT, UG Student

Abstract:

Vehicular services in smart transportation systems demand efficient and dynamic resource allocation to meet stringent latency requirements. This research proposes an Adaptive and Dynamic Allocation mechanism for delay-sensitive vehicular services within a Federated Cloud environment. The system adapts to changing service demands and resource availability, ensuring optimal allocation for diverse vehicular applications. Through dynamic adjustment based on real-time conditions, the proposed mechanism minimizes service latency and enhances overall system efficiency. The approach is validated through simulations, showcasing its adaptability and effectiveness in addressing the challenges of providing low-latency vehicular services in a Federated Cloud infrastructure.

Keywords: Adaptive Allocation,Dynamic Resource Allocation,Vehicular Services,Federated Cloud,Latency Requirements,Smart Transportation Systems,Real-Time Conditions,System Efficiency,Simulation,Service Optimization.

168. DTLS based secure group communication scheme for Internet of Things

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Abstract:

Securing group communication in the Internet of Things (IoT) is paramount for maintaining data integrity and confidentiality. This research presents a scheme based on Datagram Transport Layer Security (DTLS) to establish secure group communication in IoT environments. The proposed scheme incorporates key management and group communication protocols, ensuring end-to-end security for devices within a group. Through the integration of DTLS, the system provides cryptographic protection against eavesdropping and tampering. The effectiveness of the scheme is evaluated through simulations, demonstrating its viability and efficiency in securing group communication in IoT scenarios.

Keywords: Datagram Transport Layer Security (DTLS),Internet of Things (IoT),Group Communication,Security,Key Management,Cryptographic Protection,Data Integrity,Confidentiality,Simulation,Communication Protocols.

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169. ArsPAN : Attacker Revelation Scheme usingDiscrete Event System in 6LoWPANbasedBufferReservation Attack

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Antony Arul Doss A , IT, UG Student

Abstract:

The 6LoWPAN (IPv6 over Low-Power Wireless Personal Area Networks) protocol is fundamental in enabling communication for resource-constrained devices in the Internet of Things (IoT). However, vulnerabilities such as Buffer Reservation Attacks pose a serious threat to the integrity and availability of 6LoWPAN networks. This research introduces ArsPAN, an Attacker Revelation Scheme using Discrete Event System for mitigating Buffer Reservation Attacks. ArsPAN employs discrete event system modeling to detect and reveal attackers attempting to exploit vulnerabilities in the 6LoWPAN protocol. Through simulations and analysis, ArsPAN demonstrates its effectiveness in identifying malicious activities, thereby enhancing the security and robustness of 6LoWPAN-based IoT networks.

Keywords: 6LoWPAN,Buffer Reservation Attack,Internet of Things (IoT),Discrete Event System,Security,Attacker Revelation Scheme,Simulation,Network Integrity,Resource-constrained Devices,Vulnerability Mitigation.

170. Energy-aware Application Scheduling on DVFS-enabled Edge Computing with Mobile-Edge-Cloud Cooperation

Dr. Nancy V, IT. Associate Professor Vijayakaran M , Geethanjali R, IT, UG Student

Abstract:

Edge computing, with the integration of Dynamic Voltage and Frequency Scaling (DVFS) and Mobile-Edge-Cloud (MEC) cooperation, introduces new opportunities for energy-efficient application scheduling. This research focuses on an energy-aware approach for scheduling applications on DVFS-enabled edge computing platforms, leveraging the collaboration with mobile-edge-cloud resources. The proposed scheme dynamically adjusts voltage and frequency levels based on application requirements and resource availability, optimizing energy consumption while meeting performance constraints. Through simulations and performance evaluations, the study demonstrates the effectiveness of the approach in achieving energy efficiency in edge computing environments with the support of mobile-edge-cloud cooperation.

Keywords: Edge Computing,Dynamic Voltage and Frequency Scaling (DVFS),Mobile-Edge-Cloud (MEC),Energy-aware Scheduling,Application Scheduling,Energy Efficiency,Resource Optimization,Simulation,Performance Evaluation,Edge Computing Platforms.

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171. The Effect Of Risk Management Practices On Financial Performancein the Banking Sector.

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ABSTRACT

large extent by guidelines put forward by the Central Bank of Kenya and also the nature of the banking industry. In most cases banks had adopted a proactive and enterprise wide approach to their risk management practices by have a risk department with a manager, and had a documented risk managementpolicy which was fairly well communicated through out all levels of the organization from the Board to Staff. The study also found that some risk management practices do have significant effect on financial performance more than others i.e. the existence of a risk management policy and the integration of risk management in setting of organizational objectives were considered to be the key risk management practices that had a direct effect on financial performance. This means that although there are other determinants of performance not included in the study, the banks can improve their performance by focusing on developing strong risk management policies and integrating risk management in the process of setting achievable organizational objectives In a world that is constantly changing and with every change bringing about new ways of doing business with different outcomes, risk and how to manage it has become a critical issue. The recent global financial crisis served as a reminder that risk management and how the same is practiced is fundamental if performance objectives are to be consistently achieved. It has emerged that as business owners and managers strive to improve and sustain performance they are now also required to consider what risk management practices their organizations have adopted to avoid falling short of their strategic objectives. This is even more so in the financial services sector which was the most affected during the recent financial crisis. The objectives of this study were to analyze the risk management practices undertaken by Commercial Banks in Kenya and to determine and assess the effect of these risk management practices on their financial performance. The risks facing financial institutions are mainly classified into; strategic, operational.

Keywords: Bank industry,financial crisis,commercial Bank

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171. An Analysis Of The Impact Of Credit Risk Management On Bank Profitability.

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ABSTRACT

Credit risk management in rural and community banks has become more important not only because of the financial crisis that the world is experiencing currently, but also as a crucial concept which determines banks' survival, growth and profitability. Because credit granting is one of the key sources of income generating activity in rural banks, the management of the risk related to credit affects the profitability of the banks. This study examines the impact of credit risk management on the profitability of rural and community banks. We used the financial statements of ten rural banks from the period of 2006 to 2010 (five years) for our analysis. The panel regression model was employed for the estimation. In the model, definition of Return on Equity (ROE) and Return on Asset (ROA) were used as profitability indicator while Non-Performing Loans Ratio (NLPR) and Capital Adequacy Ratio (CAR) as credit risk management indicators. The findings indicate a significant positive relationship between non-performing loans and rural banks' profitability revealing that, there are higher loan losses but banks still earn profit. This indicates that, rural banks do not have sound and effective credit risk management practices. Theoretically, non-performing loans reduce the profit levels of rural banks but in situation where non-performing loans are increasing proportionately to profitability, then it means that rural banks do not have effective institutional measures to deal with credit risk management. What the banks do is that they shift the cost on loan default to othercustomers in the form of higher interest rate on loans. Higher interest margin charged on loanby rural banks due to weak credit risk management practices prevent microenterprises from accessing loans. Such a situation prevents business expansion and rural industrialization which are essential for poverty reduction. Most studies in this area tend to focus on the big commercial banks, thus this study with it focus on rural banks, contributes a lot to literature concerning credit risk management in small banks such as rural and community banks. In terms of policy directions, will have to tighten its control mechanisms of rural banks to stop this unfortunate trend in the rural banking industry.

Key Words: Rural Banks, Credit Risk, Profitability

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173. Analysis Of The Effectiveness Of Training Provided By AOrganisation

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ABSTRACT

Training alone is not sufficient to enhance organizational effectiveness to a greater level becausenot all knowledge obtained from the training is properly transferred and applied to the organization. This study aims to investigate whether efforts invested by Malaysian manufacturersin employee training and knowledge transfer affect organizational effectiveness. This studyadopted a quantitative research design. The questionnaire developed for this study captured the training related to individual/managerial skills, the knowledge management process in place to capture and apply the knowledge obtained through training, and the organizational effectiveness. A closed-ended online survey was sent to 1,000 members of the Federation of Malaysian Manufacturers (FMM) throughout Malaysia and 88 manufacturers responded. The unit of analysis was an organization. Organizations are urged to devise training modules depending on the needs of individual employees, create an environment that will encourage the trained employees to apply their skills (knowledge), and develop policies to retain these employees. Originality/value this paper addresses an important and not so well researched issue.It analyzes the interactions between the dimensions of knowledge management practices and type of training in improving the organizational effectiveness of manufacturing firms in Malaysia.

Keywords: Training, Knowledge Management practice, organizational effectiveness

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174. Study On Impact Of Customer Review On Online PurchaseDecision

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ABSTRACT

Technological developments have made a shift in customer behavior from purchasing through anoffline shop to purchasing through an online shop or through e-commerce. People tend to use technology to support their needs. The development of e-commerce sites is increasingly intense with many e-commerce sites competing with each other to attract the attention of sellers and buyers. Currently in Indonesia, the online shop trend is on the rise. Many new online shops have started to appear, adding to the list of old online shops that have already been in this e- commerce business. One of the ecommerce sites originating from within the country. Thepurpose of this study was to analyze the influence of online customer reviews and promotions through trust on purchasing decisions in City. The type of this research is associative research and the population in this study is in City whose number is unknown. The sampling method used is accidental sampling. Data analysis was carried out through PLS-SEM using the Smart PLS program. The results show that online customer reviews, promotions and e-trust directly have a positive and significant impact purchasing decisions in Medan City Then indirectly onlinecustomer review has a positive and significant effect on purchasing decisions through e-trust andpromotions through e-trust have a positive and significant impact purchasing decisions in the City.

Keywords: Online Customer Review, Promotion, e-Trust, Purchase Decision

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175. The Effect Of Financial Leverage On Corporate ProfitabilityInthe Manufacturing Sector.

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ABSTRACT

The study strives to examine the effect of financial leverage on financial performance in a developing country context using two OLS regression models based on panel data consisting of 816 cases (48 companies x 17 years). Financial performance is measured using ROA, ROE, EPS, and Tobin's Q, and financial leverage is measured using the debt-assets ratio and debt- equity ratio. It is observed that ROA and Tobin's Q are negatively correlated with financial leverage, which is in line with the assumptions of the pecking order theory, market timing theory,and many empirical studies. However, financial leverage has a positive effect on ROE and no effect on EPS. These results are also consistent with the MM theorem, static trade off theory and many other empirical studies. Yet again, the two OLS models have put forward conflicting results while taking EPS as the dependent variable. The results corroborate the inefficient use of debt capital and suggest the need to improve the reliability of accounting information.

Keywords: financial leverage, financial performance

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176.A Study On Factors That Influence Joining Decisions Of AnEmployee

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ABSTRACT

Past research has largely portrayed job choice as a relatively rational and goal-directed behavior where applicants make decisions contingent on organizational recruitment activities,or evaluations of job and organizational attributes. Research now informs us that job choice decisions may also be based on social comparisons and social influence. The purpose of this paper is to add to this body of knowledge by examining reasons why social influence is a key factor in job choice decisions of relatively young job seekers. The study is based on in-depth interview data from graduating seniors at an elite business school in India. Respondents did not see themselves as acting based on social influence as much as they perceived others around themto be. Reasons they noted for others' socially influenced job choice decisions were: peers and seniors are seen as more accessible and trustworthy than organizations; organizations do not share all and/or objective data, driving job seekers to other sources; job seekers are clueless andhence follow a "smart" herd; and job seekers make decisions for social status signaling. Respondents pointed to socially influenced job choices as being rational behaviors under certain conditions. This study, in a yet unexamined cultural context, points to the simultaneous and combined importance of normative and informational social determinants of job choice, bias blind spots in one's own job choice perceptions and decisions, gender specific socialization influences on job choices, and the notion of job fit in terms of fitment with expectations of important reference groups.

Keywords: India, Recruitment, Jobs, Employees behaviour, Decision.

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177.Study On Marketing Segmentation, Positioning And ValueProposition

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ABSTRACT

The Indian retail industry has been affected by numerous changes, one of which is the evolving behaviour of Indian customers. Customers are no longer shy to express the benefits they seek from retail environments and are driven towards stores which meet their individual needs. The purpose of this paper is to understand the benefits sought by Tier II city customers from retailers. An extensive literature review was conducted to identify variables for the study which were incorporated into a structured questionnaire. The instrument was administered via a store intercept survey among department store shoppers in Indian Tier II cities of Allahabad and Kanpur. The data was analysed with exploratory factor analysis to identify specific benefits desired by the customers from the store. These benefits may be used by retailers for the purpose of segmentation and build a unique, differentiated positioning platform to attract/retain customers.

Keywords: Retail industry, benefit segmentation, shopping, customer attraction, retailing.

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178.A Study On The Relationship Between FinancialDevelopmentand Economic Growth.

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ABSTRACT

Previous empirical studies on the causal relationship between financial development and economic growth are not instructive given their failure to unearth the causality trend across the different time periods. Using a more recently developed and robust indicator of financial development, we revisit the causal relationship between financial development and economic growth within the framework of a frequency-domain spectral causality technique which allows the causality to vary across time. Our findings largely suggest that, even though there is some evidence of demand-following, supply-leading and feedback hypotheses, for most part, we find strong support of neutrality hypothesis. Thus, financial development and economic growth at most frequency levels evolve independently. We infer that caution must be exercised in making general conclusions about the causal nexus between financial development and economic growth.

Keywords: Financial Development, economic growth, frequency domain.

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179. An Analysis Of The Determinants Of Mergers And Acquisitions InThebanking Sector.

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Abstract

The purpose of this paper is to explore various motivations of Merger and Acquisitions in the Indian banking sector. This includes the various aspects of banking Industry's Merger and Acquisitions. It also compares pre and post merger financial performance of merged banks with the help of financial parameters like Gross-Profit Margin, Net- Profit Margin, Operating Profit Margin, Return on Capital Employed (ROCE), Return on Equity (ROE) and Debt-Equity Ratio. Through literature review it comes toknow that most of the work done high lightened the impact of Merger and Acquisitions on different aspects of the companies. The data of Merger and Acquisitions since economic liberalization are collected for a set of various financial parameters. This study also examines the changes occurring in the acquiring firms on the basis of financial ground and also the overall impact of Merger and acquisitions (M&As) on acquiring banks. The Researcher used independent t-test for testing the statistical significance and this test is applied not only for the ratio analysis but also to test the effect of Merger and Acquisitions on the performance of banks. This performance is being tested on the basis of two grounds

i.e. Pre merger and Post merger. The result of the study indicates that the banks have been positively affected by the event of Merger and acquisitions (M&As). These results suggest that merged banks can obtain efficiency and gains through Merger and Acquisitions (M&As) and passes the benefits to the equity share holders' in the form of dividend..

Keywords: Merger & Acquisitions, Banking, Financial parameters, Profitability, Indian Banks.

180. The Effect Of Corporate Social Responsibility On Employee Retention.

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Abstract

Corporate social responsibility (CSR) has emerged as a critical philosophy and a strategy that affects employee attitudes. While much of the CSR research focuses on the relationship between CSR activities and external customers, relatively few studies examine the impact of CSR from the perspective of employees. This study examined the effect of CSR on employee engagement, satisfaction, and retention. Data was collected from 300 employees working in cement companies of Pakistan. A questionnaire was used to collect data and all scales were adopted from previous studies. Convenience sampling technique was used and respondents include both managerial as well as non-managerial staff members of the cement companies. The respondents were asked to rate their opinions on a five point Likert scale ranging from 1 strongly disagree to 5 strongly agree.
Employees were contacted personally and questionnaires were collected three weeks after distribution. Out of 4000 questionnaires distributed, 300 responses were collected. SPSS was used to analyze the data. Through regression analysis, the study found that CSR was positively associated with employee engagement, employee satisfaction, and retention. These findings are very meaningful for decision makers and researchers. It depicts that organizations can enhance their employee engagement, satisfaction, and retention through involving themselves in social activities for instance, identifying needs of the community and fulfilling them, working for better environment, involving in employee welfare, producing quality products for customers and complying with government rules and regulations and working within legal ambiance. All these activities significantly and positively influences employee positive behaviors and improve organizational performance.

Keyword: Corporate social responsibility, employee satisfaction, employee engagement, employee retention

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181. Individuals Choose To Join, Re-Join, Or Remain In A After CovidPeriod

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Abstract:

It's the quitting trend that just won't quit. People are switching jobs and indusrties, moving from traditional to nontraditional roles, retiring early, or starting their own businesses. They aretaking a time-out to tend to their personal lives or embarking on sabbaticals. Competition for talent remains fierce. For certain categories of workers, the barriers to switching employers have dropped dramatically. In the United States alone, there were 11.3 million open jobs at the end of May—up substantially from 9.3 million open jobs in April 2021.

Even as employers scramble to fill these positions, the voluntary quit rate is 25 percent higher than prepandemic levels. At the current and projected pace of hiring, quitting, and job creation, openings likely won't return to normal levels for some time. What we are seeing is a fundamental mismatch between companies' demand for talent and the number of workers willing to supply it. Employers continue to rely on traditional levers to attract and retain people, including compensation, titles, and advancement opportunities. Those factors are important, particularly for a large reservoir of workers we call "traditionalists." As a result, there is now a structural gap in the labor supply because there simply aren't enough traditional employees to fill all the openings. Even when employers successfully woo these workers from rivals, they are just reshuffling talent and contributing to wage escalation while failing to solve the underlying structural imbalance.

Keywords:Employees,Traditional,prepandemic level

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182.A Study on Adaptation of Green Building using Theory of Planned Behaviour to Consumers in India

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Abstract:
The aim of this paper is to assess the behavioural factors that influence professionals' intention to adopt green construction based on the theory of planned behaviour (TPB). The studyadopted a quantitative research design with the use of online questionnaires to elicit information from construction professionals in South Africa. Descriptive statistics of frequencies, mean and standard deviation were used to analyse the data obtained from the survey. Linear regression was also used to assess the effect of behavioural factors on professionals' intention to adopt green construction. The practical implication of the findings is that adoption of green construction in South Africa is majorly based on the positive attitude of stakeholders towards green construction and also the PBC or the perceived ease of executing green construction. However, these factors are not sufficient to generate long term commitment for green transformation among a critical mass of stakeholders in the South African construction industry. Hence, there is a need for focus on subjective norms (pressure) particularly from the government, to encourage the widespread adoption of green construction in South Africa.

Keywords : Sustainable Construction, Performance, Behavioural Factors

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183.A study on the relationship between earnings management and firmvalue.

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ABSTRACT:

The conflict of interest between managers (agents) and the owner (principals) occurs all the time, although the level of the conflict is not always similar. This is because there are separation roles or a difference of interests. In many Indonesian banks, the implementation of Good Corporate Governance (GCG) is mandatory. But, in manufacturing companies in Indonesia, GCG is still not a must. So, what is the role of GCG in conjunction with firm value in manufacturing companies? In addition, many manufacturing companies use earnings management as a benchmark of firm value. It is clear that earningsmanagement can be placed as an antecedent of firm value. The purpose of this research is to analyze the determinants of firm value in relation to earnings management and the mechanism of GCG as a moderating variable. The GCG is not viewed as an antecedent variable.
The research sample is 46 companies in the entire industry of consumer goods of manufacturing companies in the Indonesia Stock Exchange. By specific considerations, the number of the sample is reduced to 39 out of 46 companies. The method used is a moderated regression analysis (MRA).
The results show that the earnings management and the mechanism of GCG have an impact on the firm value. The dimension of GCG, namely, independent commissioner, managerial ownership, and audit quality can be placed as moderating variables and as determinants of firm value. In order to increase the firm value, it is advisable that this industry should strictly apply the mechanism of GCG as mandatory. However, the issue of GCG as an independent or moderating variable still remains debatable.

Keywords: Firm Value, Earnings Management, GCG

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184.A Comprehensive Study on HR Policies and Their Implementation

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ABSTRACT

Characteristics of the marketing organization and their relationship with strategy implementation have been the focus of considerable research over the past three decades. These characteristics include the marketing organization's structure, culture, processes, influence and leadership, among others. However, little attention has been paid to human resource management policies for marketing personnel. These policies, when properly implemented, are among the strongest motivators for appropriate individual and organizational behavior. We demonstrate in this study that the application of HR policies for mid-level marketing managers (i.e., selection, training, appraisal, and compensation) vary significantly both between firms pursuing alternative business strategies (i.e., Prospectors, Analyzers, Low Cost Defenders and Differentiated Defenders) and within each of those business strategy types by the type of marketing strategy adopted (i.e., Aggressive Marketers, Mass Marketers, Marketing Minimizers, Value Marketers). Firms whose business and marketing strategies align (Fit) demonstrated significantly stronger overall firm performance scores than those whose business and marketing strategies do not align (Misfit).

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185. IMPORTANCE OF FEEDBACK FROM CUSTOMERS

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ABSTRACT

This study demonstrates how systematically gathered employee feedback can be a vital source of information for managers. For example, employees have useful knowledge about the characteristics of your guests, the kinds of people who should be hired, the type of training those new hires need, and how best to reward employees. The procedure involves using focus groups (comprising employees who are representative of the entire employee population) to develop items for a survey questionnaire. The survey itself may be narrowly focused (e.g., dealing only with guest services) or broad in scope. In turn that questionnaire is administered to all employeesat the property. The results can then be used to revise and improve those aspects of the operation that were covered by the survey questions. The management of a service organization (an insurance company) that used this procedure learned that it was in the main supporting its employees in achieving ten top customer-service actions. The top three is customer expectations, as judged by employees, were: customers expect their calls to be answered immediately; customers expect employees to does things when they say they will; and customers expect accurate information about available rates. With that knowledge, the organization was abler tire to adjust its human-resources practices to ensure efficient delivery of le; those services most desired by customers.

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186. THE ROLE OF FINANCIAL INNOVATION IN ENHANCING FINANCIALINTERMEDIATION IN EMERGING MARKETS.

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Associate ProfessorSathyaseelan S I MBA
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ABSTRACT

Due to financial innovation, financial system ability would improve in terms of determining the market price and guaranteed liquidity for instruments, source for company's capital, encourage savings and investments through risk sharing and risk management products. The benefits accrued include avoiding regulations and optimizing taxes, reducing transaction costs and increasing liquidity of market-based products, reducing agency costs, reducing informational asymmetry, increasing risk sharing opportunities and making capital intermediation more efficient and cheaper for clients. However, new financial instruments generate repercussions via various channels. For instance, credit flows are stimulated by use of interest rates options and forward rates agreements and customers are more likely to request and commit debts. Financial intermediaries have seen a bright future due to constant innovation of financial instruments such as derivative market. Innovation in the financial sector is promoted by factors such as technological dynamism and globalization amongst others.

Key words: Financial Intermediation, Financial innovation, Financial Markets

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187.A Study on Employees' Awareness of Various HR Policies and Office Culture

VELU J VAssistant ProfessorAnusha J II MBA
Kishorekumar MI MBA
Department of Management Studies

ABSTRACT

Competition in the business world is getting tougher. This circumstance requires employees who have good engagement because employees having good engagement will have high morale, spread positive information about the organization for which they work, and always strive to provide the best for the organization. Leadership and human resource management practices within an organization shape employees' perceptions, attitudes, and behavior. Similarly, the organizational culture, shared values, governs the behavior patterns of the organizations members. This research aims to develop a development model of employees' engagement through leadership and human resource management practices through organizational culture that supports employees' engagement. The data were collected by using questionnaires involving 111 students working in companies in the Jakarta, Bogor, Tangerang and Bekasi (Jabodetabek) as research respondents. The data were analyzed by using structural equation modeling (SEM) with AMOS program. The results showed that leadership and human resource management practices have a significant positive effect on employee engagement through organizational culture. Human resource management practices directly influence employees' engagement, but the leadership has no significant direct effect on employees' engagement.

Key words: organizational culture; morale; employees' behavior.

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188. Unavailability Of Technology In Home Based Business

VELU J VAssistant ProfessorSiranjeevi K
II MBA Loganathan PI MBA
Department of Management Studies Indra Ganesan College of Engineering,
Trichy.

ABSTRACT

Smart homes embrace advanced technologies and the connectedness of devices that aim to increase consumers' life quality. They are based on data integration over shared platforms collected via sensors and wireless networks. However, although consumers' current and potential adoption of smart homes have received some research interest, there is a low numberof studies considering the foreseeable future of smart homes from the business perspective. To fulfill this gap in the literature, this study presents the results of an exploratory researchattempting to reveal the foresight of the business side regarding the penetration of smart home technologies (SHTs) into consumers' lives. Based on the opinions of industry experts collected through 13 semi structured in-depth interviews, numerous drivers of and barriers to SHT adoption are uncovered and displayed in their intertwined relationship in a thematic map. In creating this map, the qualitative data gathered through the interviews are integrated with widely used theories/models of technology adoption in the literature to develop a full-fledged set of determinants. As a result, drivers of SHT adoption (five sub-themes) and barriers that hinder smart home penetration (eight subthemes) were determined. Drivers consist of relative advantage, enjoyment, image enhancement, modern and multifunctional design, and consumers' technology innovativeness. In contrast, the main barriers are high cost, complexity, lack of compatibility, lack of trial ability, lack of observability, lack of a trusted brand in the market, lack of facilitating conditions and support services, and consumers' technology anxiety. This richset of SHT adoption determinants can be used in future studies to examine their relative impact on consumers' adoption of SHT.

Keywords: Smart homes, in-depth interview; qualitative research; IoT; internet of things; thematic map.

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189. "Design, Construction, and Testing of a Passive Solar TrackingDevice"

Mr. Ramesh Babu R, Assistant Professor,

Anbuselvam. S, Vengatraman . D, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research focuses on the development of an innovative passive solar tracking device designed to enhance the efficiency of solar energy collection. The device employs a novel combination of mechanical and optical components to autonomously adjust the orientation of solar panels, optimizing their alignment with the sun's trajectory throughout the day. The design emphasizes simplicity, cost-effectiveness, and ease of integration into existing solar energy systems. The construction phase involves the fabrication of key components using readily available materials, ensuring scalability andapplicability in diverse settings. The testing phase evaluates the device's performance under varying solar conditions, assessing its ability to maximize energy capture. Preliminary results demonstrate promising gains in energy output, highlighting the potential of this passive solar tracking device as a sustainable solution for improving theoverall efficiency of solar power generation.

Keywords: passive solar tracking, solar energy, device design, construction, testing, energy efficiency, sustainable technology, renewable energy, solar panel optimization, autonomous systems.

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190. "Design, Construction, and Performance Evaluation of a CassavaPelletingMachine"

Mr. Ramesh Babu R, Assistant Professor,

Manikandan.M, Anwar Maraikayar .A, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This study presents the comprehensive development process of a specialized cassava pelleting machine aimed at enhancing the efficiency of cassava processing for agricultural and industrial applications. The design phase involves the conceptualization and engineering of key components, considering factors such as pelletsize, production capacity, and energy efficiency. The construction of the machine entails the fabrication of the designed components, with a focus on durability and cost- effectiveness. Performance evaluation involves testing the machine under various operating conditions, assessing factors such as pellet quality, production rate, and energy consumption. Results from the performance evaluation highlight theeffectiveness of the cassava pelleting machine in producing high-quality pellets while optimizing operational parameters. This research contributes to the advancement of cassava processing technology, offering a sustainable solution for farmers and industries involved in cassava utilization.

Keywords: cassava processing, pelleting machine, agricultural machinery, design and construction, performance evaluation, pellet quality, production capacity, energy efficiency, sustainable technology, agricultural innovation.

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191. "Assessment of Oil Spillage and Its Control in the Oil and Gas Industry:Strategiesfor Environmental Sustainability"

Mr. Ramesh Babu R, Assistant Professor,

Jeyapal .R, Julius Jesus. K, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research investigates the critical issue of oil spillage within the oil and gas industry,with a focus on assessing the environmental impact and exploring effective control measures. The study encompasses a comprehensive analysis of historical and contemporary oil spill incidents, emphasizing their ecological consequences and socioeconomic implications. The research also delves into the current strategies and technologies employed in spill response and containment, evaluating their efficacy in mitigating environmental harm. Furthermore, the study explores innovative approachesand technologies for preventing and controlling oil spills, aiming to enhance the industry's commitment to environmental sustainability. The findings contribute to the development of best practices, policies, and technologies for minimizing the occurrence and mitigating the impact of oil spillage, fostering responsible environmental stewardship in the oil and gas sector.

Keywords: oil spillage, environmental impact, oil and gas industry, spill response, containment, prevention, control measures, environmental sustainability, ecological consequences, socio-economic implications.

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192. "Construction of a Standard Dual-Power Baking Oven (Electric/Gas) for Enhanced Versatility and Efficiency"

Mr. Ramesh Babu R, Assistant Professor,

Ranjith .R, Chitharthan .P, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research project outlines the design, construction, and evaluation of a versatile baking oven with dual power sources, combining electric and gas functionalities. The study addresses the growing need for flexible and energy-efficient baking solutions. The design phase incorporates engineering principles to create a compact, user-friendly mini-oven that seamlessly integrates both electric and gas heating elements. Construction involves assembling high-quality materials to ensure durability, safety, and optimal performance. The research evaluates the oven's baking capabilities, energy efficiency, and temperature control under different power sources. Results highlight the versatility and cost-effectiveness of the dual-power baking oven, offering a sustainable solution for various culinary applications. This project contributes to the advancement of baking technology, providing a practical and adaptable oven for both professional and domestic use.

Keywords: baking oven, dual power source, electric/gas, mini-oven, design and construction, energy efficiency, temperature control, culinary technology, versatile baking, sustainable kitchen appliances.

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193. "Mechanical and Corrosion Behavior of Low Carbon Steel in Crude OilInhibitedby Extracts of Acacia Nilotica (Gum Arabic Tree) Plant"

Mr. Ramesh Babu R, Assistant Professor,

Dinesh Antony .A, Francis Saveriyar .V, IV year Student, Department of Mechanical Engineering. Indra Ganesan College of Engineering.

Abstract:

This research investigates the mechanical and corrosion performance of low carbon steel exposed to crude oil, inhibited by extracts obtained from the Acacia Nilotica (Gum Arabic Tree) plant. The study explores the potential of these natural inhibitors in mitigating corrosion and preserving the mechanical integrity of low carbon steel under harsh oilfield conditions. The experimental phase involves extracting and characterizingthe inhibitive compounds from Acacia Nilotica, followed by their incorporation into the crude oil. Mechanical tests assess the steel's strength, ductility, and hardness, while corrosion studies focus on the inhibition efficiency and protection mechanisms provided by the plant extracts. Results highlight the potential of Acacia Nilotica extracts as effective corrosion inhibitors, offering sustainable and eco-friendly alternatives for safeguarding low carbon steel in crude oil environments.

Keywords: low carbon steel, corrosion behavior, mechanical properties, Acacia Nilotica, Gum Arabic Tree, crude oil, corrosion inhibition, natural extracts, eco-friendly inhibitors, oilfield materials.

194. "Investigation of the Thermal Properties of Wood Ash and Clay-Sawdust Mixturefor Application as Insulation Materials in a Rocket Stove"

Dr. BHARATHI RAJA S, Professor,

Muthuramalingam. P, Christopher. D, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research explores the thermal properties of a composite material derived from wood ash and clay-sawdust mixture with the aim of evaluating its suitability as an insulation material in rocket stoves. The study investigates the thermal conductivity, heat retention capacity, and other relevant thermal characteristics of the composite. Theexperimental phase involves the preparation of the insulation material, followed by a series of tests to assess its thermal performance under varying conditions. Results from the investigation provide insights into the composite's effectiveness in retaining and distributing heat, addressing the specific requirements of rocket stove applications. The findings contribute to the development of sustainable and locally-sourced insulation materials, supporting the optimization of rocket stove designs for increased energy efficiency.

Keywords: thermal properties, wood ash, clay-sawdust mixture, insulation material, rocket stove, heat retention, thermal conductivity, sustainable materials, energyefficiency.

195. **"HumanImmunodeficiencyVirus(HIV)-BloodInteractions:A SurfaceThermodynamics Approach"**

Dr. BHARATHI RAJA S, Professor,

Madhankumar .M, Manikandan .K, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This research investigates the complex interactions between the Human Immunodeficiency Virus (HIV) and blood components, employing a surface thermodynamics approach to gain insights into the underlying molecular and biophysical mechanisms. The study focuses on understanding how the virus interacts with various blood components at the molecular level, utilizing surface thermodynamicsprinciples to analyze the energetics and dynamics of these interactions. Experimental techniques such as surface tension measurements, contact angle analysis, and other surface-sensitive methodologies are employed to quantify the thermodynamic parameters involved. The findings contribute to a deeper comprehension of the HIV- blood interface, potentially leading to advancements in antiretroviral therapies, diagnostics, and preventive measures against HIV transmission.

Keywords: Human Immunodeficiency Virus (HIV), blood interactions, surface thermodynamics, molecular dynamics, biophysics, surface tension, contact angle analysis, antiretroviral therapies, HIV transmission, biomedical research.

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196. "Evaluation of Viability of a Crude Oil Reservoir Using PetrophysicalParameters:A Case Study"

Dr. BHARATHI RAJA S, Professor,

Palpandiyan .P, Gopinath .P, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research presents a comprehensive case study on the evaluation of the viability of a crude oil reservoir by employing various petrophysical parameters. The study focuses on understanding the subsurface characteristics of the reservoir and assessing its potential for economic oil recovery. Petrophysical parameters such as porosity, permeability, water saturation, and resistivity are investigated to analyze the reservoir's geophysical properties. Well log data, core samples, and advanced geophysical techniques are utilized to acquire and interpret the petrophysical data. The research aims to provide valuable insights into the reservoir's ability to produce economically viable quantities of crude oil, aiding in informed decision-making for exploration and production activities.

Keywords: crude oil reservoir, petrophysical parameters, viability evaluation, subsurface characteristics, well log data, core samples, geophysical techniques, economic oil recovery, exploration and production, reservoir analysis.

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197. **"Evaluation of Levelized Cost of Electricity Generated from Hot SpringGeothermal Resources"**

Dr. BHARATHI RAJA S, Professor,

Vinothkumar .T, Vignesh .R, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research undertakes a comprehensive evaluation of the levelized cost of electricity (LCOE) generated from hot spring geothermal resources, aiming to assess the economic feasibility and competitiveness of harnessing energy from this renewable source. The study considers various factors such as exploration and drilling costs, power plant construction, maintenance, and ongoing operational expenses. Geothermal reservoir characteristics, fluid temperature, and location-specific parameters are analyzed to determine the overall efficiency and potential environmental impact of electricity generation. The results provide insights into the economic viability of utilizing hot spring geothermal resources for sustainable and cost-effective electricity production, contributing valuable information for decision-makers in the energy sector.

Keywords: levelized cost of electricity, hot spring geothermal resources, economic feasibility, renewable energy, geothermal power generation, environmental impact, energy sustainability, electricity production.

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198. "Design and Construction of a Journal Bearing Demonstration Rig: AnEducational Tool for Mechanical Engineering"

Dr. BHARATHI RAJA S, Professor,

Santhosh .M, Justin Diraviam . M, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research outlines the design, construction, and educational applications of a journal bearing demonstration rig, created to enhance learning experiences in mechanical engineering. The study focuses on the development of a functional andinformative apparatus that allows students and practitioners to observe and understand the principles of journal bearings in a practical setting. The design phase incorporates engineering principles to ensure accuracy and relevance, while construction involves the fabrication and assembly of the rig components. The rig is equipped with sensors and visualization aids to provide real-time data on bearing performance. Results from the implementation of the demonstration rig in educational settings showcase its effectiveness in facilitating hands-on learning and conceptual understanding of journal bearing mechanics.

Keywords: journal bearing, demonstration rig, mechanical engineering, educational tool, hands-on learning, engineering principles, rig construction, bearing mechanics, visualization aids, practical education.

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199. "Evaluation of Rail Transportation for Petroleum Products Delivery: AComprehensive Analysis of Efficiency, Safety, and Environmental Impact"

Mr. SAMUEL M, Associate Professor,

Karthick .P, Manoj Krishna Kumar . B, IV year Student, Department of MechanicalEngineering, Indra Ganesan College of Engineering.

Abstract:
This research conducts a thorough evaluation of rail transportation as a mode for delivering petroleum products, examining key factors such as efficiency, safety, and environmental impact. The study involves a detailed analysis of rail logistics, infrastructure requirements, and the overall performance of rail transport in the context of petroleum product delivery. Safety measures, risk assessments, and emergency response protocols are considered to ensure the reliability of rail transportation for hazardous materials. Additionally, the environmental impact of rail transport, including carbon emissions and spill response capabilities, is scrutinized. The findings from this research contribute valuable insights to decision-makers in the petroleum industry and transportation sector, aiding in the development of strategies for optimizing the delivery of petroleum products through rail networks.

Keywords: rail transportation, petroleum products, delivery efficiency, safety analysis, environmental impact, logistics, hazardous materials, spill response, carbon emissions, transportation optimization.

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200. "Design of Water Supply System for a Three-Bedroom Bungalow:EnsuringAdequate Pressure and Optimal Functionality"

Mr. SAMUEL M, Associate Professor,

Paragatheeswaran .P, Karthick .P, IV year Student, Department of MechanicalEngineering, Indra Ganesan College of Engineering.

Abstract:

This research focuses on the comprehensive design of a water supply system, encompassing both cold and hot water distribution, for a three-bedroom bungalow. The study addresses the challenges of achieving adequate water pressure throughout the dwelling to meet domestic demands. Design considerations include the sizing and placement of water storage tanks, pump specifications, and the layout of piping systems for both cold and hot water. Hydraulic calculations and pressure analyses are conductedto ensure optimal functionality and consistent pressure at various points within thebungalow. The research aims to provide an effective and sustainable water supply solution, considering the specific requirements of residential dwellings, and contributes to the advancement of plumbing design practices.

Keywords: water supply system, cold water, hot water, residential design, water pressure, plumbing, hydraulic calculations, piping systems, water storage tanks, three- bedroom bungalow.

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201"Design, Construction, and Performance Evaluation of a Fixed Bed PyrolysisSystem"

Mr. SAMUEL M, Associate Professor,

Karthikeyan .T, Rajappa .K, IV year Student, Department of MechanicalEngineering, Indra Ganesan College of Engineering.

Abstract:

This research project presents a comprehensive investigation into the design, construction, and performance evaluation of a fixed bed pyrolysis system. The study focuses on the thermal decomposition of biomass or waste materials to produce valuable products such as biochar, bio-oil, and syngas. The design phase involves engineering considerations for the reactor, heating system, and process control mechanisms.Construction encompasses the fabrication and assembly of the pyrolysis system, ensuring durability and safety. The performance evaluation involves experimentation with various feedstocks and operating conditions to assess the system's efficiency, product yields, and environmental impact. Results from the study provide valuable insights into the potential applications and optimization of fixed bed pyrolysis systems for sustainable waste management and bioenergy production.

Keywords: fixed bed pyrolysis, biomass, waste materials, biochar, bio-oil, syngas, reactor design, construction, performance evaluation, sustainable waste management, bioenergy production.

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202. "Comparative Study of Different Honeycomb Geometries for the Suppression ofConvective Heat Transfer In Flat Plate Solar Collectors" **Mr. SAMUEL M, Associate Professor,**

Essakiraja .S, Karthikeyan .P, IV year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research conducts a comprehensive comparative study of various honeycomb geometries to evaluate their effectiveness in suppressing convective heat transfer in flat plate solar collectors. The investigation aims to optimize the design of honeycomb structures to enhance the thermal performance of solar collectors. Different honeycomb configurations, including cell size, shape, and arrangement, are analyzed through computational simulations and experimental testing. The study assesses the impact of these variations on convective heat transfer, thermal efficiency, and overall performance of flat plate solar collectors. The findings contribute valuable insights into the selection of honeycomb geometries for improved heat transfer suppression, facilitating the design of more efficient and cost-effective solar energy harvesting systems.

Keywords: honeycomb geometries, convective heat transfer, flat plate solar collectors, thermal performance, solar energy harvesting, computational simulations, experimental testing, thermal efficiency, renewable energy.

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203. "Application of Network Analysis to Computer-Aided Manufacturingfor Timeand Cost Optimization: A Life Cycle Perspective"

Mr. SAMUEL M, Associate Professor,

Kumaragurubaran. B, Sankaranarayanan .S, III year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research explores the application of network analysis methodologies to Life Cycle Computer-Aided Manufacturing (CAM), with a specific focus on optimizing both time and cost aspects. The study integrates network-based tools and techniques into the CAM process to enhance planning, scheduling, and resource allocation. By adopting a life cycle perspective, the research considers the entire manufacturing process, from design to disposal, aiming to improve efficiency and reduce overall production costs. The application of network analysis facilitates critical path identification, resource leveling, and risk assessment, enabling a more comprehensive and strategic approach to CAM. The findings contribute to the advancement of manufacturing methodologies, providing insights into the synergistic application of network analysis for time and cost optimization throughout the product life cycle.

Keywords: network analysis, computer-aided manufacturing, life cycle perspective, time optimization, cost optimization, manufacturing efficiency, planning, scheduling, resource allocation, production costs.

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204. "An Assessment of the Performance and Maintenance Culture of a WaterTreatment Plant"

Mr. GANESH R, Assistant professor,

Vignesh .S, Karuppanasamy .S, III year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research conducts a comprehensive evaluation of the performance and maintenance culture of a water treatment plant, focusing on its operational efficiency and sustainability. The study involves an in-depth analysis of key performance indicators, system reliability, and the effectiveness of maintenance practices employed within the plant. Various parameters, including water quality, treatment process efficiency, and equipment reliability, are scrutinized to assess the overall performance. Additionally, the research delves into the organizational culture and practices related to plant maintenance, aiming to identify strengths and areas for improvement. The findings from this assessment contribute valuable insights to enhance the operational effectiveness and longevity of water treatment plants, ensuring the consistent delivery of high-quality treated water to end-users.

Keywords: water treatment plant, performance assessment, maintenance culture, operational efficiency, sustainability, water quality, treatment process, equipment reliability, organizational culture, water infrastructure.

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205. "Investigation of Electrical Energy Consumption in Thermal Power Plants:Analysis, Optimization, and Sustainability"

Mr. GANESH R, Assistant professor,

Prakash A.T., Raghu .R, III year Student, Department of Mechanical Engineering,Indra Ganesan College of Engineering.

Abstract:

This research investigates the electrical energy consumption in thermal power plants with a focus on understanding, analyzing, and optimizing the energy usage. The study encompasses a detailed examination of various components within the power plant, including turbines, generators, cooling systems, and auxiliary equipment. Key parameters such as efficiency, power losses, and energy consumption patterns are analyzed to identify areas for improvement. The research also explores advanced technologies and strategies for optimizing electrical energy consumption, considering the plant's overall sustainability and environmental impact. The findings from this investigation contribute valuable insights for enhancing the efficiency of thermal power plants, reducing energy wastage, and promoting sustainable energy practices in the power generation sector.

Keywords: electrical energy consumption, thermal power plant, energy efficiency, power losses, optimization, sustainability, environmental impact, power generation, energy management.

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206. "Manufacturing System Optimization: A Study of Unity and Efficiencyin theProduction of Automobile Components"

Mr. GANESH R, Assistant professor.

Muthukumar .S, Prathap.M, III year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research focuses on the optimization of manufacturing systems, specifically examining the unity and efficiency in the production of automobile components. The study explores various aspects of the manufacturing process, including production line coordination, resource utilization, and workflow efficiency. The research aims to identify opportunities for improving overall system performance, reducing production costs, and enhancing product quality. Methodologies such as lean manufacturing principles, process reengineering, and advanced technologies are considered for achieving unity and efficiency in the manufacturing system. The findings from this studycontribute insights into best practices for optimizing manufacturing systems within the automobile component industry, fostering a balance between unity and efficiency for sustained competitiveness.

Keywords: manufacturing system optimization, automobile components, unity, efficiency, production processes, lean manufacturing, process reengineering, resource utilization, workflow efficiency, product quality.

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207. "Fracture Response and Cumulative Damage of E-Glass Fiber ReinforcedComposite Under Tensile and Flexural Stresses"

Mr. GANESH R, Assistant professor,

Naveen.E,Thirumaran.S,IIIyearStudent, Departmentof MechanicalEngineering, Indra Ganesan College of Engineering.

Abstract:

This research investigates the fracture response and cumulative damage behavior of E-Glass fiber-reinforced composite materials subjected to tensile and flexural stresses. The study involves a comprehensive analysis of the composite's mechanical properties, focusing on fracture toughness, tensile strength, and flexural strength under varying loading conditions. Experimental testing, including tensile and flexural tests, is conducted to characterize the material's response to different stress scenarios.Additionally, the research explores the cumulative damage accumulation over repeated loading cycles to understand the long-term durability of the composite. The findings contribute to a deeper understanding of the fracture behavior of E-Glass fiber- reinforced composites, providing valuable insights for engineering applications and structural design considerations.

Keywords: E-Glass fiber, composite materials, fracture response, cumulative damage, tensile stress, flexural stress, mechanical properties, durability, engineering applications.

208. "Modeling and Optimization of PID Controller Parameters for Deep SpaceAntenna Positioning System using Genetic Algorithm"

Mr. GANESH R, Assistant professor,

Sakthivel .S, Saravanan .G, III year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research focuses on the modeling and optimization of Proportional-Integral-Derivative (PID) controller parameters for a deep space antenna positioning system. The study employs a genetic algorithm to systematically tune the PID controller parameters to enhance the performance of the antenna system. A dynamic model of the positioning system is developed to capture its behavior under varying conditions. The genetic algorithm is then applied to optimize the PID controller parameters based on specified performance criteria such as settling time, overshoot, and steady-state error.The research aims to improve the precision and stability of deep space antenna positioning systems, contributing to the advancement of control strategies in the field ofspace communication.

Keywords:

PID controller, deep space antenna, modeling, optimization, genetic algorithm, positioning system, control strategies, space communication.

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209. "Influence of Compression Ratio on the Performance Characteristicsof a SparkIgnition Engine"

Mr. PRABAHAR K N, Associate Professor,

Suganian .R, Wilestan James .A, III year Student, Department of MechanicalEngineering, Indra Ganesan College of Engineering.

Abstract:

This research investigates the impact of compression ratio variation on the performance characteristics of a spark ignition engine. The study focuses on understanding how changes in compression ratio affect engine efficiency, power output,fuel consumption, and emissions. Experimental testing is conducted with different compression ratios to analyze their influence on combustion efficiency, thermal efficiency, and overall engine performance. The research aims to provide insights into the optimal compression ratio for achieving a balance between power output and fuel efficiency while considering emission levels. The findings contribute to the optimization of spark ignition engines for improved efficiency and reduced environmental impact.

Keywords: compression ratio, spark ignition engine, engine performance, combustion efficiency, thermal efficiency, fuel consumption, emissions, optimization.

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210. "Energy Benchmarking and Carbon Footprint Reduction Opportunities inCement Manufacturing Processes"

Mr. PRABAHAR K N, Associate Professor,Selvakumar. S. Vadivel, III year Student, Department of Mechanical Engineering,Indra Ganesan College of Engineering.

Abstract:

This research focuses on energy benchmarking and explores opportunities for reducing carbon footprints in cement manufacturing processes. The study involves a comprehensive analysis of energy consumption patterns, identifying key areas for improvement and benchmarking against industry standards. Various strategies for enhancing energy efficiency, such as process optimization, use of alternative fuels, and technological innovations, are examined to mitigate carbon emissions. Life cycle assessments and carbon footprint analyses are conducted to quantify the environmental impact of cement production. The research aims to provide actionable insights for the cement industry to optimize energy use, reduce carbon emissions, and contribute to sustainable and environmentally responsible manufacturing practices.

Keywords: energy benchmarking, carbon footprint reduction, cement manufacturing, energy efficiency, process optimization, alternative fuels, technological innovations, life cycle assessment, sustainable manufacturing.

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211. "Effective Training as a Tool for Improving Building Services in EngineeringPractice: A Case Study"

Mr. PRABAHAR K N, Associate Professor,

Velmurugan, Vignesh Babu. V, III year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research explores the role of effective training as a strategic tool for enhancing building services within the field of engineering practice. Utilizing a case study approach, the study investigates the impact of training programs on the knowledge, skills, and performance of engineering professionals engaged in building services. The research assesses the effectiveness of training in improving areas such as HVACsystems, electrical systems, plumbing, and sustainability practices. Through surveys, interviews, and performance evaluations, the study aims to identify best practices in training methodologies and their direct correlation with improved building service outcomes. The findings contribute insights for engineering practitioners, firms, and educational institutions seeking to optimize training strategies for enhanced building services in the engineering industry.

Keywords: effective training, building services, engineering practice, case study, HVAC systems, electrical systems, plumbing, sustainability, professional development.

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212. "Design of an Efficient Solid Waste Management and Disposal SchedulingSystem"

Mr. PRABAHAR K N, Associate Professor,

Balamurugan .D, Kumaraguru .R, III year Student, Department of MechanicalEngineering, Indra Ganesan College of Engineering.

Abstract:

This research focuses on the design of a comprehensive and efficient scheduling system for solid waste management and disposal. The study explores the integration of advanced technologies and data-driven methodologies to optimize the entire waste management process, from collection to disposal. The research considers factors suchas waste generation patterns, collection routes, recycling initiatives, and disposal facilities. By incorporating geographical information systems (GIS), real-time monitoring, and predictive analytics, the proposed system aims to enhance the overall efficiency of waste management operations. The findings from this research contribute to the development of smart and sustainable solutions for urban and municipal solid waste management, promoting resource optimization and environmental sustainability.

Keywords: solid waste management, disposal scheduling system, efficiency, waste collection, recycling, GIS, real-time monitoring, predictive analytics, sustainability.

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213. "Construction of Equipment for Deodorizing Kerosene: A Practical Approach toEnhance Fuel Quality"

Mr. PRABAHAR K.N, Associate Professor,

Nagarajan . P, Arun .S, III year Student, Department of Mechanical Engineering,

Indra Ganesan College of Engineering.

Abstract:

This research project focuses on the construction of specialized equipment designed for the deodorization of kerosene, aiming to improve its odor characteristics and overall quality. The study involves the development and fabrication of a deodorizing unit that utilizes appropriate techniques and materials for the removal of unpleasant odors from kerosene. The construction process includes the selection of suitable components, fabrication techniques, and quality control measures to ensure the effective and safe operation of the deodorizing equipment. The research evaluates the performance of the constructed equipment by analyzing the odor reduction efficiency and other relevant quality parameters of the deodorized kerosene. The findings contribute to the advancement of technology for enhancing the quality of kerosene, benefiting users in various applications, including domestic heating and lighting.

Keywords: deodorizing equipment, kerosene, fuel quality, odor reduction, construction, fabrication techniques, quality control, fuel technology, domestic heating, lighting.

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214. "Innovative Approaches in Automobile Motor Vehicle Construction: Design,Materials, and Performance Optimization"

Dr.V.VAITHIYANATHAN, Assistant professor,

Suseeindran V, Syed Kaja S, III year Student, Department of MechanicalEngineering, Indra Ganesan College of Engineering.

Abstract:

This research focuses on the latest developments and innovative approaches in the construction of automobile motor vehicles. The study encompasses various aspects of design, materials, and performance optimization to meet evolving industry standards and consumer expectations. Key areas of investigation include lightweight materials, advanced manufacturing techniques, aerodynamics, safety features, and sustainable technologies.

The research aims to contribute to the advancement of automobile construction methods, enhancing fuel efficiency, safety, and overall performance. By exploring cutting-edge technologies and design principles, this study provides insights into the future trends and considerations in the construction of motor vehicles, aligning with the industry's pursuit of sustainability and technological advancement.

Keywords: automobile construction, motor vehicle design, materials, performance optimization, lightweight technologies, advanced manufacturing, aerodynamics, safety features, sustainable technologies.

ISBN:978-81-970087-7-1

215. "Exploring the Mechanical Properties of Spider's Cobwebs: Nature's EngineeringMarvel"

Dr.V.VAITHIYANATHAN. Assistant professor,

Balamurugan R.S, Tamilarasan G, III year Student, Department of MechanicalEngineering, Indra Ganesan College of Engineering.

Abstract:

This research investigates the remarkable mechanical properties of spider's cobwebs, aiming to uncover the secrets behind their strength, elasticity, and adaptability. The study delves into the unique structural components of spider silk, examining factors such as tensile strength, toughness, and flexibility. Mechanical testing methodologies, including tension and compression experiments, are employed to quantify the material's performance under various conditions. The research explores the potential applications of spider silk-inspired materials in engineering and biomimicry, considering their extraordinary mechanical properties for innovations in fields such as materials science, textiles, and medical devices. By understanding the intricacies of spider's cobwebs, this research contributes to the broader knowledge of biomimetic materials and their implications for various technological advancements.

Keywords: spider silk, cobwebs, mechanical properties, tensile strength, toughness, elasticity, biomimicry, materials science, engineering marvel, biomimetic materials.

216. "Design and Construction of a Two-Wheel Motorized Scooter: A ComprehensiveApproach to Sustainable Urban Mobility"

Dr.V.VAITHIYANATHAN, Assistant professor,

Thamotharan K, Thanasekaran G, III year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research project focuses on the design and construction of a two-wheel motorized scooter, emphasizing a comprehensive approach to address the growing need for sustainable urban mobility solutions. The study encompasses the engineering and design considerations for a compact, efficient, and eco-friendly scooter. Key aspects, including frame design, powertrain configuration, energy storage, and safety features, are thoroughly explored to ensure optimal performance and rider comfort. Additionally,the research considers the integration of emerging technologies, such as electric propulsion systems and smart connectivity, to enhance the scooter's functionality and user experience. The findings from this project contribute to the development of environmentally conscious and practical alternatives for urban transportation, aligning with the global push towards sustainable mobility solutions.

Keywords: two-wheel motorized scooter, design and construction, sustainable urban mobility, engineering considerations, electric propulsion, energy storage, safety features, smart connectivity, eco-friendly transportation.

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217. "Design and Implementation of an Automated Motor Vehicle Driving LicensingSystem: Enhancing Efficiency and Security"

Dr.V.VAITHIYANATHAN, Assistant professor,

Valarmathi M, Venkatesh Babu G, III year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research project focuses on the design and implementation of an automated motor vehicle driving licensing system, with a primary goal of improving efficiency and enhancing security in the licensing process. The study encompasses the development of a comprehensive software and hardware infrastructure that streamlines various aspects of the licensing system, including application processing, testing, and record- keeping. The implementation involves the integration of advanced technologies such as biometrics, image recognition, and database management systems to ensure accuracy, reliability, and security. The research aims to provide a user-friendly, efficient, and transparent solution that facilitates the licensing process while minimizing fraud and improving overall road safety.

Keywords: automated motor vehicle driving licensing system, efficiency, security, software infrastructure, hardware integration, biometrics, image recognition, database management, road safety.

218. "Optimization of Cement Manufacturing, Production, and Packaging: A CaseStudy in Sustainable Practices"

Dr.V.VAITHIYANATHAN, Assistant professor,
Vincent Paul Raj, Yogeswaran K, III year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research presents a comprehensive case study on the optimization of cement manufacturing, production, and packaging processes with a focus on incorporating sustainable practices. The study examines the entire cement production lifecycle, including raw material extraction, clinker production, blending, milling, and the final packaging stage. Key aspects such as energy efficiency, resource utilization, emissions reduction, and waste management are analyzed to identify opportunities for improvement. The research explores innovative technologies, alternative raw materials,and eco-friendly packaging solutions to enhance the sustainability of the entire cement manufacturing process. The findings contribute valuable insights for the cement industry to adopt environmentally responsible practices while maintaining operational efficiency.

Keywords: cement manufacturing, production optimization, sustainable practices, case study, energy efficiency, emissions reduction, waste management, eco-friendly packaging, raw material utilization, clinker production.

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219. "Exploring the Impact of Water Adsorption/Entrapment on Residual ThermalStresses during the Cure of Polymer Composites"

Mr.T.DAVID UBHARA SAMY, Assistant professor,

Deepak P, Ganesh M, II year Student, Department of Mechanical Engineering,

Indra Ganesan College of Engineering.

Abstract: This experimental study delves into the intricate relationship between water adsorption/entrapment and the development of residual thermal stresses during the curing process of polymer composites. The investigation employs advanced techniques to analyze how the presence of water within the composite material influences the evolution of thermal stresses post-cure. By systematically varying water content and monitoring the resulting stress patterns, the study aims to provide valuable insights into the fundamental mechanisms underlying the interplay between water interaction and thermal stress development in polymer composites. The findings from this researchhold significant implications for optimizing manufacturing processes and enhancing the performance and durability of polymer composite materials.

Keywords: polymer composites, water adsorption, water entrapment, residual thermal stresses, curing process, material optimization, composite manufacturing, thermal stress analysis.

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220. "Development and Characterization of Recycled High-Density Polyethylene(rHDPE)/Natural Fiber Composites"

Mr.T.DAVID UBHARA SAMY, Assistant professor,
Karthick R, Karuppaiah M, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This study focuses on the sustainable utilization of recycled high-density polyethylene (rHDPE) in combination with natural fibers for the development of composite materials. The research involves the formulation and processing of rHDPE-based composites with varying proportions of natural fibers, followed by a comprehensive characterization of the resulting materials. Mechanical, thermal, andmorphological properties of the composites are systematically investigated to assess their performance and suitability for diverse applications. The incorporation of natural fibers not only enhances the sustainability of the composites but also introduces unique properties that contribute to their overall functionality. The findings from this research provide valuable insights into the development and potential applications of eco- friendly rHDPE/natural fiber composites, contributing to the advancement of sustainable materials in various industries.

Keywords: recycled high-density polyethylene (rHDPE), natural fibers, composite materials, sustainable development, mechanical properties, thermal analysis, morphological characterization, eco-friendly composites.

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221. "Investigating the Effects of Process Parameters on the Tensile Strength ofCoconut Fiber-Reinforced Cashew Nut Shell Liquid (CNSL) Resin Composites"

Mr.T.DAVID UBHARA SAMY, Assistant professor,

Mahesh R.A.N, Prasanth C, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This research delves into the optimization of process parameters influencing the tensile strength of composites fabricated from coconut fibers and cashew nut shell liquid (CNSL) resin. The study systematically explores the impact of varying processing conditions, such as fiber length, resin curing time, and composite curing temperature, on the resulting tensile strength of the materials. Through a series of controlled experiments, mechanical testing, and statistical analysis, the research aims to identify the optimal combination of parameters for enhancing the tensile strength of these eco-friendly composites. The findings contribute to the understanding of the manufacturing process and provide valuable insights for the development of high-performance and sustainable coconut fiber-reinforced CNSL resin composites.

Keywords: coconut fiber, cashew nut shell liquid (CNSL) resin, composite materials, tensile strength, process optimization, eco-friendly composites, mechanical properties, sustainable materials.

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222. "Design, Simulation, Construction, and Performance Evaluation of a Solar BoxCooker"

Mr.T.DAVID UBHARA SAMY, Assistant professor,

Ram Prasath R, Sudharsan V, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This comprehensive study presents a holistic approach to the development ofa solar box cooker, encompassing the design, simulation, construction, and subsequent performance evaluation. The research begins with a detailed design phase,incorporating advanced simulation techniques to optimize the cooker's geometry and energy capture efficiency. The constructed solar box cooker is thoroughly described, highlighting key components and material choices. Subsequently, the performance evaluation involves testing the cooker under varying conditions, measuring parameters such as temperature distribution, cooking time, and overall energy efficiency. The findings provide valuable insights into the practical application and effectiveness of the solar box cooker as a sustainable and energy-efficient cooking solution, contributing to the advancement of renewable energy technologies.

Keywords: solar box cooker, design optimization, simulation, construction, performance evaluation, renewable energy, sustainable cooking, energy efficiency.

223. "Analysis of an Automatic Control System for Online Blending of Petrolwith Corrosion Inhibitor in the Direct Continuous Electronic Fuel Injection Automobile Engine"

Mr.T.DAVID UBHARA SAMY, Assistant professor,

Sugumaran P, Wenten Berck K, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This research focuses on the analysis of an innovative automatic control system designed for the real-time blending of petrol with a corrosion inhibitor in a direct continuous electronic fuel injection (EFI) automobile engine. The study encompasses the development and implementation of the control system, investigating its efficacy in maintaining optimal fuel composition to mitigate corrosion within the engine. Through a combination of experimental tests and computational simulations, the research evaluates the system's ability to seamlessly adjust the blending process during various driving conditions. The findings aim to provide insights into the reliability and performance of the automatic control system, shedding light on its potential to enhance the durability and efficiency of EFI automobile engines while addressing corrosion-related concerns.

Keywords: automatic control system, online blending, petrol, corrosion inhibitor, direct continuous electronic fuel injection, automobile engine, corrosion mitigation, fuel composition, engine durability, efficiency improvement.

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224. **"Design and Fabrication of an Electrical Motorized Bicycle Wheelchair"**

Mr.G DEEPAN KUMAR, Assistant Professor,

Karthikeyan .T, Rajappa .K, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This research project outlines the comprehensive design and fabrication process of an innovative electrical motorized bicycle wheelchair. The study involves the integration of an electric motor system into a wheelchair frame, providing users with anefficient and sustainable mobility solution. The design considerations encompass ergonomic factors, user-friendly controls, and a robust frame structure to ensure safety and comfort. The fabrication process involves the assembly of components, includingthe integration of the electrical motor, battery system, and bicycle elements. Performance testing evaluates the wheelchair's speed, range, and overall functionality. The findings contribute to the development of accessible and eco-friendly mobility options, catering to individuals with diverse mobility needs.

Keywords: electrical motorized bicycle wheelchair, mobility solution, electric motor system, wheelchair design, fabrication, ergonomic design, user-friendly controls, sustainable mobility, accessibility,

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225. Title: "Development of Metal Matrix/Coconut Shell Ash Particulate Compositesfor Automotive Applications"

Mr.G DEEPAN KUMAR, Assistant Professor,Mahamuni R, Naveen Kumar T, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This research focuses on the development of advanced metal matrix composites reinforced with coconut shell ash particulates for automotive applications. The study encompasses the formulation, processing, and characterization of these composites, aiming to enhance the mechanical and thermal properties while reducing overall weight. The incorporation of coconut shell ash, an environmentally sustainable and readily available agricultural waste, adds both ecological and economic value to the composite materials. Various fabrication techniques and metal matrix combinations are explored to optimize the composite's performance for automotive components. Comprehensive mechanical, thermal, and microstructural analyses are conducted toevaluate the feasibility of these composites for use in automotive applications,addressing the demand for lightweight and environmentally friendly materials in the automotive industry.

Keywords: metal matrix composites, coconut shell ash, particulate reinforcement, automotive applications, lightweight materials, sustainable composites, mechanical properties, thermal analysis, composite fabrication.

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226. "Finite Element Model for Predicting Residual Stresses in ShieldedMetal ArcWelding of Mild Steel Plates"

Mr.G DEEPAN KUMAR, Assistant Professor,

Karthick R, Karuppaiah M, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This research presents a finite element modeling approach to predict residual stresses induced during the shielded metal arc welding (SMAW) process on mild steel plates. The study involves the development and validation of a comprehensive numerical model that simulates the thermal and mechanical aspects of the welding process. The finite element analysis considers factors such as heat input, welding parameters, and material properties to predict the distribution of residual stresses within the welded mild steel plates. Through systematic simulations and experimental validation, the research aims to enhance understanding and accuracy in predicting residual stresses, providing valuable insights for optimizing welding parameters and mitigating potential issues related to structural integrity in welded components.

Keywords: finite element model, residual stresses, shielded metal arc welding, mild steel plates, welding simulation, thermal analysis, mechanical simulation, welding parameters, structural integrity, numerical modeling.

227. "Economic Viability Assessment of a Small Hydropower Plant: Case Study andAnalysis"

Mr.G DEEPAN KUMAR, Assistant Professor,

Dinesh Kumar R, Dinesh Kumar V, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This study investigates the economic viability of a small hydropower plant, considering various financial, technical, and environmental factors. Through a comprehensive analysis, the research assesses the project's feasibility, taking into account initial investment costs, operational expenses, expected energy generation, and potential revenue streams. Economic indicators such as the net present value (NPV), internal rate of return (IRR), and payback period are utilized to evaluate the financial attractiveness of the small hydropower plant. Additionally, environmental and social considerations are integrated into the assessment to ensure sustainability. The findings provide valuable insights for stakeholders, investors, and policymakers interested in thedevelopment of small hydropower projects, offering a comprehensive perspective on their economic viability and potential contributions to renewable energy portfolios.

Keywords: small hydropower plant, economic viability, feasibility analysis, financial indicators, renewable energy, sustainability, energy generation, environmental impact, investment assessment.

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228. "Design, Simulation, Construction, and Testing of a ThermosyphonSolar WaterHeater for a Block in Postgraduate Hostel"

Mr.G DEEPAN KUMAR, Assistant Professor,

Suseeindran V, Syed Kaja S, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This research project focuses on the development of a thermosyphon solar water heater tailored for the specific needs of a block in a postgraduate hostel. The study begins with a comprehensive design phase, incorporating advanced simulation techniques to optimize the system's efficiency and performance. The constructed solar water heater is described in detail, emphasizing key components and considerations for installation in a hostel setting. Rigorous testing is conducted to evaluate the system's ability to provide reliable and sustainable hot water for the designated block. The findings contribute valuable insights into the practical application of thermosyphon solar water heaters in hostel environments, showcasing their potential for energy savings and environmental sustainability.

Keywords: thermosyphon solar water heater, design optimization, simulation, construction, testing, renewable energy, hostel facilities, sustainable heating, energy efficiency.

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229. "Design, Construction, and Testing of an Improved CastingPouring Ladle"

Mr.G DINESHWARAN, Assistant Professor,

Karthick M, Karthik L, II year Student, Department of Mechanical Engineering,

Indra Ganesan College of Engineering.

Abstract: This research project focuses on the development of an enhanced casting pouring ladle, aiming to optimize its design, construction, and performance. The study begins with a detailed design phase, incorporating innovative features and materials to improve efficiency, safety, and overall functionality. The construction process is outlined, highlighting key considerations in material selection and manufacturing techniques. Rigorous testing is conducted to evaluate the ladle's performance under various casting conditions, considering factors such as pouring accuracy, thermal stability, and durability. The findings contribute to the advancement of casting ladle technology, providing insights into the practical application of improved designs in foundry operations for enhanced productivity and safety.

Keywords: casting pouring ladle, ladle design, construction, testing, foundry operations, pouring accuracy, thermal stability, durability, casting technology, improved ladle design.

230. "Characterization of Nigerian Coals for Power Generation: A ComprehensiveAnalysis"

Mr.G DINESHWARAN, Assistant Professor,

M Ganesh, R Sudhakar, II year Student, Department of Mechanical Engineering,

Indra Ganesan College of Engineering.

Abstract: This research investigates the essential characteristics of Nigerian coals with the aim of evaluating their suitability for power generation. The study involves a thorough characterization process that includes proximate and ultimate analyses, determination of calorific value, ash content, sulfur content, and other relevant parameters. The comprehensive analysis considers the coal's physical, chemical, and thermal properties, providing valuable insights into its combustion behavior and potential environmental impacts. The findings from this research contribute to a better understanding of the energy potential of Nigerian coals, aiding decision-makers in the power generation sector and facilitating informed choices for sustainable and efficient coal utilization in power plants.

Keywords: Nigerian coals, power generation, coal characterization, proximate analysis, ultimate analysis, calorific value, ash content, sulfur content, combustion behavior, energy potential.

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231. "An Evaluation of the Potentials of Natural Gas in Economic Development"

Mr.G DINESHWARAN, Assistant Professor,Alagar .M, Nethaji .M. II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract:

This research critically assesses the multifaceted potentials of natural gas as a catalyst for economic development. The study delves into various dimensions, including the economic, environmental, and geopolitical aspects of natural gas utilization. Key factors such as energy production, industrial applications, and the transition to a cleaner energy landscape are examined to gauge the impact of natural gas on economic growth. Additionally, the research explores the geopolitical implications of natural gas trade and its role in enhancing energy security for nations. Through a comprehensive evaluation, this study aims to provide a holistic understanding of how the strategic harnessing of natural gas resources can contribute significantly to economic development at regional and national levels.

Keywords: natural gas, economic development, energy production, environmental impact, industrial applications, cleaner energy, geopolitical implications, energy security, economic growth.

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232. "Design, Simulation, Construction, and Performance Evaluation of a Thermosyphon Solar Water Heater"

Mr.G DINESHWARAN, Assistant Professor,

Anberasan .M, Barath.V, II year Student, Department of Mechanical Engineering,

Indra Ganesan College of Engineering.

Abstract: This research project encompasses the complete lifecycle of a thermosyphon solar water heater, from initial design and simulation to construction and final performance evaluation. The study begins with a meticulous design phase, integrating innovative features to enhance efficiency, reliability, and ease of use. Advanced simulation techniques are employed to predict the system's behavior under different conditions and optimize its performance. The constructed solar water heater is then detailed, highlighting key components and construction considerations. Rigorous testing and performance evaluation follow, assessing parameters such as heat absorption, transfer efficiency, and overall effectiveness in providing reliable hot water. The findings contribute valuable insights into the practical application of thermosyphon solar water heaters, showcasing their potential for sustainable and efficient water heating.

Keywords: thermosyphon solar water heater, design optimization, simulation, construction, performance evaluation, renewable energy, sustainable heating, energy efficiency.

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233. "Computational Fluid Dynamics (CFD) Modeling of Turbulence-Induced DraginVehicle Aerodynamics"

Mr.G DINESHWARAN, Assistant Professor,

Kumaraguruberan. B, Sankaranarayanan .S, II year Student, Department of Mechanical Engineering, Indra Ganesan College of Engineering.

Abstract: This research focuses on the application of Computational Fluid Dynamics (CFD) to model and analyze turbulence-induced drag in vehicle aerodynamics. The study employs sophisticated numerical simulations to investigate the complex flow patterns andturbulence effects around a moving vehicle, with a particular emphasis on drag forces.The research involves the development of a comprehensive CFD model that considers various vehicle shapes, speeds, and environmental conditions. Through systematic analysis, the study aims to gain insights into the turbulence-induced drag phenomena andidentify potential design modifications or aerodynamic enhancements to minimize drag, thereby improving fuel efficiency and overall vehicle performance. The findings contribute to advancing the understanding of turbulence-related challenges in vehicle aerodynamics and offer practical solutions for optimizing vehicle design.

Keywords: Computational Fluid Dynamics (CFD), turbulence-induced drag, vehicle aerodynamics, numerical simulations, drag force analysis, aerodynamic optimization, fuelefficiency, vehicle performance.

234. FreeVibrationofCompositeRectangularPlateswithInternalCrack

1.DR.Anusuya M

2.R.Abinaya,3.V.Charulatha

Abstract

In this work, rectangular sheets of composite materials consisting of epoxy with a single layer of fiberglass were studied, with an internal crack at angles (0°, 90°) with respect to the x-axis, in the presence of nanomaterial TiO_2 in proportions (1wt%, 2wt%, and 3wt%). The study involved experimental and numerical analyses using ANSYS. The sample mold was created from plastic using a CNC machine. One case was examined in both the experimental and numerical parts, which is clamped-clamped-free-free (CC-FF).After conducting the tests, it was observed that the crack had a negative impact on the rectangular composite plate, as it reduced the value of the natural frequency and increased damping. However, with the addition of nanomaterial, it was discovered that the natural frequency increased with the percentage of nanomaterials, reaching its maximum value at 3%. This increase in frequency is attributed to the enhancement in hardness, which stiffens the rectangular plates and reduces damping. The error rate between the experimental and numerical parts did not exceed 9.717%.

Keywords: Compositematerials,Internalcracks,Fracture,Naturalfrequency,ANSYS

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235. AnalysisofSpurGearDesignParametersandSurfaceFinishfor Robotic Applications

1. DR.Anusuya M

2.M.Hariharan,3.E.Ilayaraja

Abstract

The improvement of gear performance and durability is crucial for enhancing the performance of various manufacturing industries. Spur gears are favored for their simplicity and reliability, yet their performance is heavily influenced by surface finish and geometric parameters. This study focuses on the spur gear as a component in robotic transmissions and highlights its pivotal role in robotic application performance. The aim is to analyze the impact of surface roughness and geometric parameters, particularly gear manufacturing errors such as tooth runout, tooth flank errors, and center distance errors, as these errors significantly affect performance, durability, and quality. Understanding such errors enables optimization of gear design parameters, critical for achieving high precision, low speed, durability, and load-carrying capabilities in robotic applications.Experimental studies on a spur gear were conducted in a laboratory, wherein the gear's characteristics were measured. The Smartic M device, a portable instrument designed for accurate and reliable measurements, was used to measure surface roughness along the gear's teeth. A total of 129 measurements and data were acquired. The data was meticulously analyzed to identify the three best and three worst values obtained. The findings indicated that smoother surfaces exhibit lower friction and wear. Geometric parameters play a vital role in optimizing gear meshing and alignment, directly influencing torque transmission and noise levels.The results revealed that the three least optimal results stemmed from the pitch diameter, where gears typically mesh. The study concluded that surface roughness and geometric parameters of spur gears are crucial factors to study and analyze for robotic applications. Optimizing these factors has the potential to significantly enhance performance by improving the efficiency of robotic applications, leading to higher precision, quieter operation, and longer lifespan.

Keywords: Manufacturing, Spur Gear, Geometric Parameters, Surface Roughness, Robotic Applications, Gear Performance

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Manikandam, Trichy-620 01.

236. An Efficient Hybrid MetaheuristicAlgorithmReDe-NMforSolving Industrial Optimization Problems Paper Title

1. DR.Anusuya M

2. Jayasoundarya M,3. Kalpanapriya R

Abstract.

To address the pressing demand for effective solutions to complex optimization challenges, researchers have increasingly focused on pioneering novel methodologies. In this study, a novel hybrid optimization approach termed "Roulette Wheel Selection and Nelder-Mead-based Improved Differential Evolution" (ReDE-NM) is introduced to optimize real-world industrial problems. Initially, the proposed method is validated by applying it to tackle two mechanical engineering design problems. Subsequently, we compare the optimization results obtained with ReDE-NM against those achieved by state of the art methods featured in the existing literature. Our findings reveal that the proposed method demonstrates rapid convergence and outperforms most benchmark problems in terms of solution quality and computational efficiency. Moreover, ReDE-NM is applied to fine-tune crucial cutting parameters during the turning operation of X210Cr12 steel, leveraging a multilayer-coated carbide insert (GC-4215). Fitness functions are derived for tangential cutting force and surface roughness, with mathematical expressions for these objectives generated using the Response Surface Methodology (RSM).

Keywords: Metaheuristic Algorithm, Nelder-Mead, Multi-Objective Optimization, Eco-Friendly Machining, Turning.

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237. MoistureContentandMeasurementMethodsof Polymers

1. DR.Anusuya M

2. Kaviya T,3. Kowsalya I

Abstract

Polymers can be grouped according to many aspects. One way of grouping them is related to their ability to absorb water. Some polymers are capable of absorbing water, called hydrophilic polymers, while others exhibit hydrophobic characteristics. The extent to which a polymer can absorb water depends on several factors.The most significant difference between the two types of polymers is that hydrophilic polymers are able to bind and absorb water because there is a polar group on the side chain or main chain to which the water molecule can bind. Hydrophobic polymers do not have alcohol groups, so they cannot absorb water due to their apolar nature.In the case of hydrophilic materials – if the moisture level exceeds 0.05-0.15% - the material must always be prepared and dried based on the parameters specified by the manufacturer before use. The drying time depends on the moisture content of the material, the layer thickness, and the efficiency of the dryer. In many cases, the parameters given by the manufacturer are not exact; the values given here are usually significantly shorter, and they refer only to the most efficient dryers. For this reason, it would be necessary to include the measurements of the moisture content in the preparation process. There are many methods for this, and with the continuous development of technology, it is possible to determine the moisture in the granules more and more precisely. Nowadays, one of the most common measurement methods is the Karl-Fischer titrator; this is a special analytical method that can be used to determine the water content of the tested material with great accuracy. The basis of the method is a selective reaction, during which iodine, in the presence of a base, converts sulfur dioxide into sulfite. The reaction requires water; 1 mol of water is needed to convert 1 mol of iodine. The other most common method is thermogravimetric measurement: the weight of the sample is weighed, then dried until the mass is constant, and then its weight is measured again. The difference between the two measured values gives us the moisture content. However, this value is unfortunately not accurate in all cases; in the case of some polymers, as a result of longer-term heating, a part of the volatile additives also evaporates, which is also measured in the moisture content.

Keywords:Polymer,MoistureContent,MeasurementMethods

ISBN:978-81-970087-7-1

238.Modeling and Measuring Residual Stresses in a Thick-Walled Pipe StructureWeldedwithaBuried-ArcTechnique:AComparativeStudy

1. DR.Anusuya M

2. Ponniyammal B,3. Rajabunisha M

Abstract.
This study focuses on the modeling and measurement of residual stresses in a thick-walled pipe structure, specifically welded using a buried-arc technique. Employing a comparative approach, the research aims to provide insights into the effectiveness of different welding methods in managing residual stresses within the welded structure. The combination of modeling techniques and experimental measurements contributes to a comprehensive understanding of the factors influencing residual stresses, offering valuable information for optimizing welding processes in thick-walled pipe structures.

Keywords: Welding,ResidualStresses,NumericalModelingSimulation

ISBN:978-81-970087-7-1

239.InvestigationoftheImpactofSurfaceRoughnessonVehicle's Resistance

1.DR.Anusuya M

2. Rajesh K,3. Rajeshwari D

Abstract.

This study conducts a comprehensive examination of the influence of surface roughness on the resistance characteristics of the KVLCC2 tanker ship, employing state-of-the-art Computational Fluid Dynamics (CFD) technology. Systematic exploration encompasses a range of parameters, including diverse roughness heights, ship velocities, and specific hull sections (bow, parallel hull segment, and stern). The study rigorously applies the RANS equations and the k-ω SST model to solve the Navier-Stokes equations, ensuring a thorough analysis. Methodological robustness is validated through a benchmark test involving a roughened plate, affirming the efficacy of CFD in yielding high-quality results. The research extends its focus to scrutinize the nuanced influence of surface roughness on individual resistance components, addressing both pressure and viscosity components.Within the context of the increasing importance of maritime transport, renowned for its advantages in storage and transportation, shipping companies are compelled to optimize vessel fuel consumption. This imperative aligns with overarching objectives of mitigating greenhouse gas emissions and reducing operational costs to enhance company profitability. A key determinant impacting speed, power requirements, and fuel consumption is hull resistance. Leveraging the capabilities of Computational Fluid Dynamics (CFD), this research employs specialized wall functions that account for roughness effects on the boundary layer near the hull. The outcomes are meticulously compared with those derived from a smooth surface model. Moving beyond the assessment of surface roughness's impact on hull resistance to pressure, the methodology accommodates nonlinear factors, including the spatial distribution of contaminants, ship movement in waves, and thrust-induced effects on hull resistance.

Keywords: Resistance,ANSYS,CFD,RoughnessHeight,K-ωSST

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340. FuzzyLogicIntegrationforEnhancedMobileRobotPath Planning and Navigation

1. MRS.K.RAMYA

2.M.Salram,3.Umamabeshwari R

Abstract

The intersection of mobile robot path planning and fuzzy logic has garnered significant interest in recent years. This connection leverages fuzzy logic's capacity to handle complex, imprecise, and uncertain data, thereby enhancing path planning efficiency and reliability. The utilization of training data remains a key recommendation to expedite tuning. By incorporating input/output decision data from a human operator alongside real-world sensor data, we achieve a faster and more accurate calibration of the mobile robot's navigation system. This paper presents a novel approach to enhancing mobile robot navigation within complex environments, with a particular focus on maintaining precise positions within narrow corridors. In addition to the custom cost function and tunefis integration, we introduce innovative elements to further improve the process. The approach leverages the power of fuzzy logic for advanced decision-making, considering not only obstacle avoidance, energy efficiency, and navigation speed but also incorporating real-time sensor data for more informed choices. Furthermore, we introduce alearning mechanism that allows the robot to adapt and refine its navigation strategies over time.This adaptive component significantly reduces the tuning process's duration and improves overall efficiency. This enhancement represents a substantial advancement in the field of mobile robot navigation, paving the way for more efficient and adaptable robotic systems in complex environments.

Keyword: MobileRobots,PathPlanning,FuzzyLogic,Navigation,ObstacleAvoidance

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241. Lattice Structured HipImplant Optimization UsingtheLinear Regression Method

1.MRS.K.Ramya
2.G.Vijaya Krishnan,3.J.Abdur Rahman

Abstract

Many factors play a significant role in finding the optimal latticed design of the patient-specific hip implant. These factors affect the two main defining parameters of the lattice structure with which the implant is optimized. The parameters are the length and thickness, and they control the biomechanical properties of the latticed design because they affect the topological shape of the lattices. Lattice structures' porosity is not an easy measure to calculate. This study proposes building a machine-learning model using the Linear Regression algorithm to predict the porosity values out of the length and thickness values of the lattice structure's beam.Machine learning (ML) was used to optimize the unit cell parameters to generate results that consume time and effort if done manually. Jierwang and Ajit Panesar have proposed a novel approach using ML to design graded lattice structures, emphasizing ML's potential in enhancing the design speed and optimality.ANSYS software is used to create the hip implant design and apply three types of unit cells to the proposed design. The design parameters of the unit cells are optimized to get the best values that create a lattice-structured body most suitable for osseointegration. The three applied types of unit cells are 3D lattice infill, Double pyramid and face diagonals lattice, and Octahedral lattice 2. The porosity was calculated for a set of many values of the length and thickness of the lattice structure beam for all three types of unit cells. The necessary libraries like Pandas for data handling, NumPy for numerical tasks, scikit-learn's LinearRegression for modeling, r2-score for R-squared calculation, and plotly.graph-objs for 3D plotting were imported. In Jupyter Notebook 6.4.5, the dataset was loaded from a CSV file using Pandas. The features (length and thickness) and target variable (porosity) were extracted and stored in arrays 'X' and 'y'. Subsequently, a linear regression model was established and trained with 'X' as features and 'y' as the target.To evaluate the accuracy of the models, a thorough comparison will be conducted between the predicted values and the data in the dataset. All three models are expected to achieve an accuracy of over 95%. The focus is on refining the porosity of the lattice-structured hip implant using machine learning algorithms.

Keywords: Optimization,MachineLearning,LatticeStructures.

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242. StudytheInternalCorrosionofPetroleumPipes

1.MRS.K.Ramya
2.M.Arun Kumar,3.R.Bharath Kumar

Abstract.
Internal corrosion of oil pipelines is one of the problems facing the petrochemical industry,becausecrudeoilanditsproductsarecomplexmixturescontainingacids,alkalis,saltsand other corrosive substances, so corrosion reactions are easy to occur between them and the inner surface of the conveying pipe. Furthermore, equipment damage caused by corrosion can increasethe risk of accidents and reduce the effectiveness of safety procedures. Each year, losses due to various types of corrosion represent 3% to 4% of the world's GDP, so the search for means tohindercorrosion and increasethecorrosion resistanceof pipelines has becomean important topicin the oil production and industry sector. During the exploitation and assembly of oil and natural gas wells containing large amounts of carbon dioxide, condensate oil, hydrogen sulfide and brine, there will be serious corrosion of the oil or gas transport system. Since the medium of the oil and gas collection and transportation pipeline is gas, water, hydrocarbon, and the solid multi-stage flow medium, especially in the later stage of oil and gas field development, the water content of the transport medium will increase due to water injection exacerbating corrosion in pipelines.Therefore, the internal corrosion mechanism and technology of pipelines have received wide attention from research institutions related to corrosion resistance, and are increasingly becoming a fulcrum for research hubs seeking to increase corrosion resistance. In the present study, the corrosion environment of the internal pipeline in the laboratory was simulated according to the actual operating parameters of the oil pipelines, where the partial pressure of carbon dioxide, the speed of the corrosion medium, temperature, the time of corrosion and the corrosion retardant were selected as variables to indicate the extent of their impact on the emergence and propagation of corrosion.

Keywords: InternalCorrosion,OilPipelines,CorrosionRetardant

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243. Optimizing Grinding Cycle Times for Maximum Efficiency through Dynamic Programming

1.MRS.K.Ramya
2.R.Dharani,3.JavaharNisha B

Abstract. In the field of manufacturing and machining, the optimization of grinding cycle is of paramount importance. with the goal of optimizing efficiency to the fullest extent. This article will delve into the various utilization of dynamic programming as a potent methodology to achieve this objective. By applying the principles of complex mathematical modeling, aim is to minimize grinding cycle times while maintaining the standards of quality, durability and mechanical properties of the treated metals. The results of our research confirm the high potential of improving the mechanical treatment of metals in grinding operations through the mathematical use of dynamic programming.

Keywords: Accuracy,Mechanical,Cycles,Grinding,Feed,Optimal,Radial

244. Design of Equipment Suitable for Jigsaw Testing

1.MRS.K.Ramya
2. Kalaiyarasan A,3. Mohamed Fahadhu A

Abstract

In this paper, we present the conceptual design of a jigsaw test bench. The testing equipment is suitable for testing sawing of soft and hard materials. The jigsaw is powered by a battery, which drives a DC motor. The rotational motion is converted into linear motion through a Scotch Yoke mechanism. With the help of this test bench, we can measure the voltage drop and current consumption of the battery during sawing, from which we can deduce how the cutting force occurring during sawing affects the performance provided by the battery.

Keywords: Jigsaw,Measurment,CuttingForce

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245. ModelingtheInteractionofAirandAluminumattheFreeSurfacein High-Pressure Die Casting Using CFD

1.MRS.K.Ramya
2. Rakesh S.3. Akshay K

Abstract
In the metalworking industry, High-pressure die casting (HPDC) within a cold room is nowadays a very important place, where the cold room for this process mainly comprises an injection cylinder for injecting the molten metal into the mold using a piston. This technique makes it possible to obtain very high-quality parts with a very good surface finish, but unfortunately, the air that is in the injection cylinder can be locked in the metal during the injection phase. So, the main flaws of this technique are porosity and air entrapment. The purpose of this study is to find a law of piston acceleration to minimize air entrapment during the slow injection phase and porosity in the final product, where the work was highlighted in the analysis of the effects of each of the piston accelerations, fill rate, surface tension, and viscosity on the free surface wave motion. The flow of the molten metal in the casting chamber and the thermal study of the process were studied by introducing certain boundary conditions to allow improvement and avoid the occlusion of the air.

Keywords:HPDC,AirEntrapment,VOF,FreeSurface,DynamicMesh

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246. AnalysisoftheEvolutionofPressureLossesinaHighPressure Hydraulic System

1.MRS.K.Ramya
2. Bharathkumar S M,3. Bhuvaneshwari M

Abstract

In our work, we present the results of an experimental study carried out on the analysis of the influence of the clogging of the filtering element on the admissible resistance of a hydraulic filter. The filter is installed on the discharge line of a variable displacement pump, and the service pressure is around 210 bar. The hydraulic system studied is used to supply hydraulic energy to a finisher in the hot rolling mill at the IMITTAL-Algeria steel complex. In this context, we tested the retention efficiency of the filter, whose mesh dimensions of the filter element are 15 µm. The influence of the service time as well as the number of polluting particles retained by the filter on the singular pressure drop ΔP of the filter have been characterized accordingly. A statistical analysis on a representative sample of the evolutionary values of ΔP, followed by adjustment tests, were also presented.
The statistical analysis carried out clearly shows that the evolution of the local pressure drops of the filter follows a Beta law. The knowledge of the distribution law of a parameter is an advantageous result that will help to establish a maintenance program, with the aim of acting in time, and this to remedy the failures of which the pollution of the oil is considered the main cause.

The results obtained through this study are considered as decision support tools of the hydraulic system's safety, namely the development of a conditional maintenance plan with the aim of controlling the quality of the energy transmitted by a hydraulic system.

Keywords: Pollution,StatisticalAnalysis,PressureDrop,OilAnalysis,HydraulicFilter

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247.The Influence of the Superficial Plastic Deformation by Rolling on DoubleLayerSinteredMaterialsBasedonNC100.24andAstaloyMo

1.MRS.K.Ramya
2. Dhinesh C,3. Eyarkai Kamali R

Abstract. The paper analyses the influence of superficial plastic deformation by rolling on some mechanical properties for double layer sintered materials based on NC 100.24 and Astaloy Mo.Fatigue is a process influenced by microstructure, surface topography, geometry, frequency, stress amplitude and isone of the important failure mechanism of structural parts [1].Samples containing two layers were produced by pressing and sintering. One layer was NC100.24 and the second layer were a mixture of NC100.24 and Astaloy Mo in different proportions (20, respectively 25 wt.% Astaloy Mo and the rest NC100.24). Compaction pressure was 300 MPa, and sintering was conducted in endogas (0.65 % C) at 1120 °C. Bone shape specimens were produced. The specimens were tested to fatigue contact to different cycles (5160, 10320, and 20640).Tensile strength and harness were measured. The microstructure of samples was studied by light microscopy. The depth of influenced structure was measured.

Keywords: ContactFatigue,Nc100.24,AstaloyMo

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248. UsingBayesianOptimizationforCharge-MixingCanReduceDensity Functional Theory Simulation Time

1.MRS.K.Ramya

2. Gokulnath P R,3. Hariharaswamy M

Abstract.

The computational simulation of nanostructures using Density Functional Theory (DFT) has become indispensable in materials science and nanotechnology. However, the high computational energy consumption associated with accurate DFT calculations remains a significant bottleneck. This extended abstract presents a novel approach that employs Bayesian optimization for charge mixing optimization to mitigate the computational energy overhead during nanostructure simulations. Charge mixing is a crucial step in DFT calculations, responsible for self-consistently updating the electronic charge density. Bayesian optimization, a powerful machine learning-driven technique, is harnessed to intelligently search for optimal charge mixing parameters, thereby reducing the number of iterations required for convergence.The Bayesian optimization framework efficiently explores the charge mixing parameter space, guiding the simulation towards rapid convergence and lowering the computational energy consumption. By systematically optimizing the charge mixing process using Bayesian optimization, this research not only accelerates the convergence of DFT calculations but also significantly reduces the computational energy requirements, making nanostructure simulations more environmentally friendly and cost-effective. The study showcases the impact of this approach through practical applications on a range of nanostructures, highlighting substantial energy savings without compromising the accuracy of results. To evaluate the effectiveness of the Bayesian optimization-driven charge mixing approach, several experiments will be conducted on different nanostructures, including nanoparticles, nanowires, and 2D materials. The computational energy consumption and convergence rate achieved by the proposed methodology would be also compared to traditional DFT simulations for reference.

Keywords: BayesianOptimization,Charge-Mixing,DensityFunctionalTheory

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249. NaturalFrequencyExaminationInIndustrialRobot

1. MRS.K.Ramya
2. Harish .R 3. Harrish.M

Abstract

For the accurate control of an industrial robot vibrations must be damped. The damping ratio is affected by the materials used, the weight of the robot, the kinematic characteristics, and the foundation used. This study measures the damping factor of the Mitsubishi Melfa RV-2SDB using impulsive testing. The values are given for multiple axes of the row The measurement is done for multiple axis of the robot in the configurationshownonFig.1.Impulse was given manually by the means of a rubber mallet. The vibrations were captured by the NI9234 Sound And Vibration Analog InputModule.The damping factor was calculated by the method shown in [1]. The method consists of determining the logarithmic decrement δ, and based on that the damping factor ζ.

The natural frequency was determined by analyzing the frequency response captured at the same time.

Keywords: Industrial Robot, Natural Frequency, Impulsive Testing, Logarithmic Decrement,DampingFactor

250. AnalysisofHorizontalandVerticalGrindingTechnologies

1.MRS.K.Ramya
2. Harun Rasheeth S,3. Hema T

Abstract

Grinding technologies are widely used for finishing operations of various types of parts to provide better surface roughness and accuracy for the selected surfaces. These technologies are expensive and take a lot of time to execute; consequently, they are used when it is reasoned. The goal of this research is to compare the manufacturing design process for horizontal and vertical grinding, where the arrangement distinction between them is just the position of the tool axis compared to the machined surface of the workpiece. All of the necessary manufacturing parameters are determined to ease the design process. After the manufacturing design, CAM design and CNC program writing are possible if a CNC-controlled machine is applied. Using the same manufacturing parameters, a comparative manufacturing analysis is done to determine the differences between the two processes.

Keywords: Manufacturing,Tool,Workpiece,Vertical,Horizontal,Grinding

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251. NaturalFrequencyExaminationinIndustrialRobot

1.MS.Kalaivani T

2. Jacop Antony L 3. Jeevanantham S

Abstract.

For the accurate control of an industrial robot, vibrations must be damped. The damping ratio is affected by the materials used, the weight of the robot, the kinematic characteristics, and the foundation used. This study measures the damping factor of the Mitsubishi Melfa RV-2SDB using impulsive testing. The values are given for multiple axes of the robot. The measurement is done for multiple axes of the robot in the configuration shown in Fig.1. Impulse was given manually by the means of a rubber mallet. The vibrations were captured by the NI9234 Sound And Vibration Analog Input Module. The damping factor was calculated by the method shown in [1]. The method consists of determining the logarithmic decrement δ and based on that the damping factor ζ. The natural frequency was determined by analyzing the frequency response captured at the same time.

Keywords: Industrial Robot, Natural Frequency, Impulsive Testing, Logarithmic Decrement, Damping Factor.

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252.The Influence of Different Grain Refining Fluxes and Master Alloy Addition on the Melt Quality of an Aluminum Casting Alloy

1.MS.Kalaiveni T

2. Kathirvel K,3. Keerthana J

Abstract.

Rotary degassing, coupled with the addition of different fluxes, is the most common melt treatment method in aluminum foundries, due to its high efficiency in inclusion removal and the possibility of grain refining. In this study, the effect of different fluxes and master alloy addition was investigated on the melt and casting quality in different stages of the melt preparation.Four experiments were conducted, labeled as "A", "B", "C", and "D". In all cases, ENAC-45500 alloy (the standard composition in weight percentage is 7% Si, 0.5% Cu, 0.4% Mg, 0.12% Ti) was melted in a shaft-type melting furnace and then approximately 1000 kg was poured into a resistance-heated holding crucible furnace. In case "A", we applied a melt cleaning flux, whereas in case "D" we used the same flux combined with the addition of Al-5%Ti-1%B grain refining master alloy. In cases "B" and "C", cleaning and grain refining fluxes from different suppliers were used.

Keywords:GrainRefining,MeltTreatment,Flux,MasterAlloy,AluminumCastingAlloy,Rotary Degassing,MeltCleaning

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253.Analysis of Parameters Affecting Fire Protectin PUR Foam Systems

1.MS.Kalaivani T

2. Kowshik G,3. Madhan Kumar P

Abstract.

The applications of rigid PUR foam systems are in the electronics, automotive, furniture, and construction industries. Such polymers are used, for example, for heat and sound insulation materials, dashboard covers, automotive and furniture industry composites. Their great advantage is the many technologies (molding, RIM, in situ) that provide easy manufacturing and a usability window that continues to make them important representatives of plastics. Rigid systems have the widest range of applications due to their thermal insulation properties (thermal insulating mobile wall and adhesive wall-mounted thermal insulation products). It is important that the 10 cm thick rigid foam corresponds to a 40 cm wall. Its durability or heat resistance can be improved by using different additives. The biggest difference between flexi and rigid foam is the use of isocyanate and catalyst pack. Flexi foam typically uses toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI). The isocyanate component of the rigid system can be hexamethylene-1,6-diisocyanate (HDI v. HMDI), methylene diphenyl diisocyanate (MDI), and polymeric methylene diphenyl diisocyanate (pMDI). The latter is produced by partial polymerization of MDI and is mainly used for the production of cross-linked polyurethanes.It is not enough to know about the foam. that it has foamed and even that the reaction time was adequate. We need to do tests on the foam itself. This is done using physical examination methods. These include density measurement, tensile strength, tensile strength, air permeability, cell structure testing, compressive and indentation hardness, cyclic load tests, compressive strength, etc. Tests according to the standard are very important, the results of which must be satisfactory for all buyers and analysts because it is recorded how the measurement should be carried out.It is very important for industry and customers to develop materials that can withstand high temperatures. Thus, there is a lot of experimentation and research into the use of fillers in PUR systems. In addition to having a protective function, the filler can also change other parameters that are beneficial during use, such as hardness and environmental resistance.

Keywords: PUR System, PUR Foam, Rigid Foam, Filling Content, Filling Material Type, Flammability Test, Pir Foam

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254.Electro chemical Corrosion Resistance of a Wire and Arc Additively Manufactured Duplex Stainless Steel

1.MS.Kalaivani T

2. Manikandan N,3. Mohamed Gani A

Abstract

The wire arc additive manufacturing (WAAM) process combines gas-shielded metal arc welding and additive manufacturing. The WAAM process can reach a deposition rate of at least 10 kg/hour. In our research, 2209 type (22% Cr and 9% Ni alloying) duplex stainless steel (DSS) samples were manufactured by the WAAM process. DSSs are primarily used in chloride-bearing environments, where pitting corrosion is the general form of degradation.To investigate the pitting corrosion resistance of additively manufactured 2209 type DSS, a 300x250x20mm block was made by the WAAM process. As the microstructure is expected to be inhomogeneous in the cross-section of the wall, samples with different orientations were machined out. Due to the thermal cycle of the subsequent welding passes in each layer, the microstructure differs from the 60% austenite and 40% ferrite in the annealed bulk material. To restore the phase balance, one sample was also heat-treated with a peak temperature of 1350°C to achieve at least 30% ferrite content, as required by standards such as ISO 17781.The pitting corrosion resistance can be measured by electrochemical techniques in a standard three-electrode cell in 3.5wt% NaCl electrolyte. It was found that the microstructure and the annealing heat treatment both had an effect on the pitting corrosion resistance, and the sample with the balanced microstructure showed better corrosion resistance.

Keywords:PittingCorrosion,DuplexStainlessSteel,WireArcAdditiveManufacturing

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255.Evaluation and Comparison of MachineLearning Algorithms for American Sign Language Recognition

1.MS.Kalaivani T

2. Mohamed Thoufik U,3. Mohamed Yunuz R

Abstract.

Hand gesture communication involves fast-paced hand movements that are difficult for simple traditional algorithms to understand. Combining deep learning algorithms and computer vision technologies offers a compelling new way to comprehend sign language, enabling web accessibility users to communicate with their devices more naturally, simulating their communication in real life.In this work, we compare and evaluate three deep learning algorithms, determining which is most effective in interpreting sign language data to understand which can deliver the best results for accessibility users. For this paper, the sign language used is the American Sign Language (ASL) system to produce standardized results.The main contributions of our work are as follows: Firstly, we utilized the public ASL (American Sign Language) data set, extending the set through rotation and stretching during data preprocessing and then splitting the data set into training, validation, and testing sets. Secondly, we tested three state-of-the-art algorithms on the ASL dataset: Convolutional Neural Network (CNN), Deep Neural Network (DNN), and the Random Forest algorithm. Testing the CNN model, we obtained the results: training set accuracy of 99.99%, validation set accuracy of 99.99%, and testing set accuracy of 99.69%. For DNN, the results were 100%, 99.81%, and 97.95%, respectively. Random Forest attained 100%, 94.95%, and 90.78%.Finally, after comparing and evaluating the results, we found that the CNN model produced the highest overall accuracy among the three algorithms. Even though the DNN and Random Forest achieved 100% training accuracy, the substantive result of the testing set accuracy was lower than that of the CNN's achieved result.

Keywords: Gesture Recognition, DNN, CNN, Machine Learning, Deep Learning, Neural Network, Random Forest, Hand Gestures

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256.What is Raman Spectroscopy Good for?From the Perspective of Research, Development, and Innovation

1. MS.Kalaivani T

2. Mohammed Riswaan M,3. Naveenkumar S

Abstract

Raman spectroscopy is a branch of vibrational spectroscopy that allows for the empathetic structural identification of various chemical and biological materials based on their unique vibrational characteristics, all without destroying the sample. It is a powerful tool for the characterization of energetic materials, biological systems, pharmaceuticals, and semiconductors. Additionally, quality examination of different industrial processes is a main focus of its application, aiming to obtain products with higher quality and without any contamination. Therefore, such a technique has become important in industrial automation as well.Recently, Raman spectroscopy has been successfully used for stress and temperature analysis in semiconductors, polymers, composites, and silicon-coated metal/alloy surfaces. For example, it is often employed to study and measure the local mechanical stresses in materials, as well as their grain size and phase properties. Based on the Raman band position shift and Raman intensity ratio, Raman spectroscopy can quantitatively calculate the residual stress and the thickness of the subsurface damage layer of semiconductor materials. Moreover, Raman spectroscopy has been extensively used to characterize the influence of mechanical deformation on microstructure changes in biomaterials.Furthermore, Raman spectroscopy offers powerful analytical capabilities for automated systems. For instance, dangerous samples such as trialkylaluminum compounds can be handled safely. Immersion Raman probes can be utilized in dangerous environments, such as those with elevated temperature, pressure, or toxic internal environments of industrial vessels.

Keywords: RamanSpectroscopy,Surface-enhancedRamanSpectroscopy

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257.Optimizing the Clamping Components of a VibratingSystem on a Plow

1.MS.Kalaivani T

2. Nithya A,3. Poornima C

Abstract

In this work, a method for optimizing the main clamping components for a vibration system on the working body of a plow is presented to reduce the forward forces. To achieve this goal, a variable geometric model is established, considering unique operational parameters, and a three-dimensional finite element model is generated for conducting an optimization investigation. The 3D finite element analysis is automatically refreshed for each version of the geometric model. An optimization analysis is characterized by defined goals or objective functions, alongside design variables and constraints. For instance, one can adjust the dimensions of a component to minimize material usage while ensuring that stresses remain below a predefined threshold. In this scenario, the volume being minimized serves as the objective function, the dimensions under adjustment represent the design variables, and the stress limitation acts as the behavioral constraint. The main objective is to optimize fasteners using finite element analysis to reduce production cost with maximum efficiency.

Keywords: StaticSimulation,DynamicSimulation,DesignStudy,Frequencies

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258. Uniform Torsion of BarHaving Cross Section Bounded byTwo Hyperbola Arcs

1.DR. MAHAVEER SREE JAYAN M

2.Prasanna Balaji C,3. Praveen Jayaseelan B

Abstract

In this paper, an analytical solution is presented for the Saint-Venant torsion of a bar with a solid cross-section. The cross-section of the considered bar is bounded by two hyperbola arcs, and its material is homogeneous, isotropic, and linearly elastic. The presented solution is based on the theory of uniform torsion developed by Saint-Venant and Prandtl. The solution of this paper for uniform torsion of the bar is established based on the determination of Prandtl's stress function.Initially, the problem is explained, and the boundary curves and their parameters are described. After that, the parameters of the hyperbola arcs are determined by means of conditions connected with Prandtl's stress function. The shearing stresses, the torsional rigidity, and the torsion function are derived as well. A numerical example is provided to represent the considered analytical solution. The level lines of Prandtl's stress function, the torsion function, and the contour lines of the resultant of the shearing stresses are illustrated throughout the cross-section.

The results of this paper can serve as a benchmark solution to verify the accuracy of usual numerical methods such as FEM, BEM, Finite Differences, etc.

Keywords: StressFunction,TorsionalRigidity,Saint-Venant,Torsion,Prandtl,TorsionFunction

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259. Optimal Number of Cellsina Numerical Grid for Fluid Flow around the Body

1. DR. MAHAVEER SREE JAYAN M

2. Rajapushpam V,3. Reethika R

Abstract

In this paper, we investigate the optimal number of cells in a numerical grid, which can be applied in various numerical simulations. A body with a random shape is positioned in a plane and subjected to fluid flow around it. The body's shape is random and characterized by two dimensions: length (l) and height (h). By enclosing the body in a rectangle and extending the lines of the rectangle's sides across the domain, the fluid domain can be divided into several zones with different dimensions. Our approach dictates that every fluid domain should consist of eleven segments, each segment containing a specific number of cells with varying shapes. We will provide numerical solutions for a cylindrical body with a randomly assigned inlet velocity, expressed as a mathematical function, and compare the results with experimental data. Additionally, we will demonstrate the procedure for obtaining the numerical grid and formulate the precise number of cells in each domain part, including critical zones directly surrounding the body.

Keywords: FluidMechanics,CFD,NumericalGrid,Cells

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260.ThermoplasticElastomersfromRecycledGroundTyreRubber

1. DR. MAHAVEER SREE JAYAN M
2. Resika A V R,3. Santhosh P

Abstract. Oneofthebiggestchallengesnowadaysistheupcyclingofrubberproducts,mainlytyre s. Tyres are complex composite products made of different types of rubber (typically natural, styrene- butadiene, butadiene, and butyl rubber), combined with reinforcing and filling materials (carbon black, silica) and reinforcing pads of different materials (steel, polymer), While typically metallic reinforcing materials can be recycled by melting after tyre dismantling, this is not the case for tyre rubber: they cannot be melted due to their cross-linked structure. This is why tyre recycling is typically either energy-related or secondary, it can mostly be used to make a product of inferior quality to the original. The most modern and forward-looking direction for recycling elastomers in thematerial is devulcanization and reclamation, processes that aim at breaking cross-links. Thefirst step is to grind the elastomeric part of the tyres for better handling, resulting in ground tyre rubber (GTR). This GTR then can be devulcanized typically by thermomechanical or thermochemical methods. The resulting devulcanizate can be revulcanized with typically inferior mechanical properties compared to a primary rubber elastomer due to the inevitable chain scission. For this reason, this type of recycling can only be "down-cycling", producing a product of inferior quality compared to the original material.

-

Keywords: Devulcanization, Ground Tyre Rubber, Polypropylene, Thermoplastic Dynamic Vulcanizates

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261.Analysis of Different Commercial Solid Fluxes Used for the Melt Treatment of Casting Aluminum Alloys

1. DR. MAHAVEER SREE JAYAN M
2. Saravanaperumal S
3. Selvalakshmi G

Abstract

The application of casting aluminum alloys in industries such as automotive and aerospace has seen a rise in interest due to their cost-efficient manufacturing, excellent castability, high strength-to-weight ratio, and recyclability. However, the quality of the liquid metal during manufacturing plays a crucial role in determining the performance of the cast parts.During the melting, melt handling, and casting stages, the reactivity of liquid aluminum alloys often leads to the formation of oxide inclusions and the dissolution of hydrogen. To mitigate these issues, foundries commonly use fluxes to reduce inclusion content and employ degassing techniques to lower solute hydrogen concentration in the liquid alloys. Rotary degassing treatments are often combined with flux addition to achieve simultaneous reduction of inclusion and hydrogen content in the melts.While there has been significant research on foundry fluxes, there is limited literature available that assesses melt cleaning efficiency while analyzing the phase composition of commercially available fluxes. Therefore, this study aims to combine industrial melt treatment experiments with characterization techniques to gain insights into the behavior of solid fluxes.In this work, rotary degassing treatments coupled with flux addition using five different commercial fluxes were conducted on batches of ENAC-46000 alloy melt. Each flux was used in three treatment cycles. The melt quality was evaluated using the QualiFlash technique and Bifilm Index (BI) analysis of reduced pressure test (RPT) samples. Furthermore, the phase composition and thermal behavior of the fluxes were investigated using X-ray diffraction (XRD) and differential thermal analysis (DTA), respectively.

Keywords:Casting,MeltTreatment,Degassing,Fluxes,MeltQuality,Aluminum

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262. Optimization of Spring back and Thinning During DeepDrawing Process

1.DR. MAHAVEER SREE JAYAN M

2.Sivakumar P,3. Sudhakaran V

Abstract

During forming process, various geometric parameters play an important role in determining the amount of the spring back. These parameters can include factors such as sheet thickness, friction coefficient, and the radii of the dies. Furthermore, it is important to note that this phenomenon is also influenced by the material selection and the applied load. The aim of this research is to investigate the impact ofradii ofboth lower and upper dies, as well as the blank holder force on the spring back amount,and the thinning that occurs during elasticrecovery of the material during deep drawing process. The investigation will be followed by thedevelopment of an optimization strategy.

Keywords: Springback,Thinning,OptimizationProcesses,St14Steel,WeightingMethod

263. Getting Prepared to Understand and also to Jointly Prepare the HarmonizedForesightViewsontheFutureofManufacturinginEurope

1. DR. MAHAVEER SREE JAYAN M
2. Sugavaneshwaran S,3. Sumaiya Begam S

Abstract. This conference presentation explains how the European Technology Platform named as Manufuture generates and spreads white papers, consultation documents on various hot key issues related to *What comes next?* in Europe under manufacturing research, development and EU implementation issues. The Hungarian Scientific Association for Mechanical Engineering, called GTE, is the local host for the National ManuFuture Technology Platform. The GTE is challenging the scientific, academic and industrial ecosystem actors to get involved with the forward-looking activities on the future of the European manufacturing industries.

Keywords: Manufacturing,Foresight,Whitepaper,AI,Material,Bio-Intelligence,3DPrinting

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264. Segregation Simulation Study of Metal 261Powders in Additive Manufacturing Technology

1.DR. MANIVASAHAM .A
2. Suriya R,3. Suruthi Y

Abstract.
In this article,we have looked at method stosimulatethespreadingandmeltingofmetallic powder. In the literature, several simulation models have been proposed to adequately describe the melting and thermal processes. One of the main and perhaps the most important aspects of additive manufacturing (AM) processes using powder bed technology is the uniform distribution of powder particles.The formation of ametallic powder layer of constantthicknessisessentialfortheproduction of melted/sintered layers of good quality. Computer simulations can help to understand the melting process, during which the metal particles melt and solidify within a short time. The spreading of metallicparticlesisal way sinfluenced by the properties of the basepowder.Variousdiscreteelement method (DEM) models allow this to be studied.

Keywords:AdditiveManufacturing,AM,MetalPowder,PowderSegregation,DEM,DEM Simulation.

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265. ReductionofEnergyRequirementsoftheExtrusionofClayMasseswith Additives

1.DR. MANIVASAHAM .A
2. Suruthi M,3. Surya D

Abstract

In the heavy clay industry, when calculating energy requirements, it's common to focus solely on the energy needed for drying and firing processes, overlooking the significant electricity consumption during preparation and shaping stages. Extrusion is the predominant forming method in this industry, typically requiring substantial extruder head pressures, often ranging from 10 to 20 bar, depending on product shape and clay plasticity. Modern trends in brick manufacturing emphasize thinner internal walls for improved thermal insulation. However, forming such thin clay walls increases energy demands. To address this, achieving optimal clay paste plasticity becomes crucial, often necessitating the use of additives to enhance clay flow behavior during extrusion.In this study, two types of clay (brick and roof-tile clay) with moisture content ranging from 18 to 21 wt% were examined. Two commercially available clay plasticizing additives, Fabutit 734 and Budit 8H, were added in varying concentrations (0-0.3 wt%). Clay masses were prepared using a laboratory pan mill and conditioned in an airtight environment for 24 hours. The experiments were conducted using a ceramic laboratory vacuum extruder (KEMA PVP 5/s type) under consistent conditions, with a screw shaft speed of 35 rpm.The impact of additives was evaluated based on the electrical power demand of the extruder, measured using a dedicated measuring system connected to the extruder. Electrical signals were processed using HBM Spider 8 amplifier and CATMAN software.

The results indicated that adding Fabutit 734 to brick clay led to a reduction in electricity demand by 7-9%, while the addition of Budit 8H plasticizer lowered electric consumption by 6-8% for roof tile clay. These findings highlight the potential benefits of using clay plasticizing additives in reducing energy consumption during the extrusion process, thereby enhancing energy efficiency and cost-effectiveness in heavy clay manufacturing.

Keywords:Plasticity,Extrusion,Clay,EnergyDemand,Additives

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266.The Effect of Inorganic Based Plasticizerson ClayBodies

1.DR. MANIVASAHAM .A
2. Syed Anwar S,3. Thavapriya S

Abstract

In this study, the focus was on investigating the plasticity properties of clay and plasticizer compounds, particularly in the context of their application in the heavy clay industry, where extrusion is a common forming method. In extrusion, a mixture of clay and water is used as a raw material to create a plastic clay mass. The presence of clay minerals in the clay mass results in the formation of a lyophilic, active layer on their surface due to the OH radicals present in water. This phenomenon facilitates the slipping of clay particles over each other, enabling plastic deformation. Typically, forming a clay mass requires extrusion pressures of 15-20 bars. However, the energy demand for extrusion can be reduced by incorporating different plasticizers into the clay mixture. These additives modify surface tension, viscosity, and ionic concentration, thereby influencing the plasticity of the clay mass

In this research, two commercially available clay additives based on sodium tripolyphosphate (Fabutit 734, Budit 8H) were employed to investigate their effects on the plasticity of Hungarian clay. The additives were incorporated into the clay in varying amounts (0, 0.1, 0.2, 0.3, 0.4, and 0.5 wt% relative to the weight of dry clay). Plasticity was assessed using two different methods. Additionally, the influence of additives on drying sensitivity was examined using the Macey method. The mineral composition of the clay was analyzed using X-ray powder diffraction, while the plasticizers were analyzed using FTIR spectroscopy.

Through this comprehensive investigation, the study aimed to elucidate how the inclusion of specific plasticizers affects the plasticity of clay masses, providing valuable insights for optimizing clay processing methods in the heavy clay industry.

Keywords: Plasticity,DryingSensitivity,Clay,MoistureContent

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267.MaterialCharacterizationbyMagneticBarkhausen-NoiseMethod

1 DR. MANIVASAHAM .A
2. Vasanthavel S,3. Vengadeswari M

Abstract

In the industrial sector, the non-destructive testing of ferromagnetic materials holds significant importance. By monitoring changes in the magnetic field, known as Barkhausen noise, caused by the rearrangement of domain structures in these materials, various material properties can be determined. External magnetic field excitation enables the investigation of these materials in real-world industrial applications. The magnetic Barkhausen noise measurement technique (MBN), which involves determining the RMS average value of noise packages, serves as a suitable method for assessing material microstructure, stress state, chemical composition, and surface treatment condition of ferromagnetic materials.Since the late 1980s, a new trend in MBN has emerged, focusing on the analysis of individual noise pulses. Following proper sample preparation, this approach expands the range of materials that can be tested by examining the amplitude, width, and area distribution functions of the noise pulses. Additionally, it allows for the determination of additional parameters related to the structure and state of the materials.This paper aims to summarize MBN measurement techniques based on both the RMS average of noise packets and individual noise pulses. It will outline the characteristics of these measurement techniques and their applications in determining material parameters. By providing insights into these techniques, the paper aims to contribute to the advancement of non-destructive testing methods for ferromagnetic materials in various industrial applications..

Keyword:

ferromagnetic materials, – Barkhausen, material parameters, invidualnoisepulses, magnetic field

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268. ApplicabilityofHigh-EntropyAlloys

1.DR. MANIVASAHAM .A
2. Vijay Infant A,3. Vishwa S

Abstract.
Inthe21stcentury,anewchapterinmaterialsscience has been opened with the appearance of high-entropy alloys (HEA). These alloys, which contain five or more elements in roughly equalamounts,differfromconventionalalloys,whichareoftenbasedonasinglemainelement(basemetal) to which one or more other elements are added in small amounts to achieve the desiredproperties.Inconventionalalloys,thereisusuallyadominantphasetowhichsecondaryphasesmaybeattached. By changing the composition, the arrangement of the atoms changes, and this affects the properties ofthealloy,which can befurthermodified, e.g. byheattreatment,to achievethedesired phases and microstructure. High-entropy alloys exhibit simple crystal structures due to high entropy, such as lattices that are body-centered cubic (BCC), face-centered cubic (FCC) or hexagonal close-packed (HCP).Secondary phases are much less common ,although they can occur.The presence of asimilar proportion of many elements makes the atomic arrangemen to HEA as much more homogeneousand disordered.In conventional alloys, diffusion inhibition is often achieved by using small amounts of alloying elements to increase the number of lattice defect sort by creating secondary phases that inhibitatomic motion.Inhigh-entropyalloys,the large number of different elements results in highentropy,which can lead to a slowing of diffusion due to the disorder of the atomic arrangement. This property can be advantageous in terms of corrosion resistance and use at high temperatures.
Some conventional alloys, such as titanium-based alloys, are used for hydrogen storage, but their capacity is limited. SomeHEAs exhibit outstanding hydrogen storage capacity dueto their complex atomic arrangement and unique microstructure. This could be important for energy storage and fuel cells.

Keywords: MaterialScience,Applicability,High-EntropyAlloy,ModernMaterials

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269. Dual-PurposeSolarCollector

1. DR. MANIVASAHAM .A
2. Yogapriya N.3. Vishwa S

Abstract.
Solar energy is a renewable and sustainable energy source with significant potential to shape the future energy landscape. It finds utility across various domains, with solar systems broadly classified into solar thermal (ST), solar photovoltaic (PV), and dual (hybrid) systems. Among these, solar thermal systems harness radiant heat from the sun, with solar collectors being a crucial component. Solar collectors can be liquid or air-based, and the integration of both types into a single facility, known as a dual-purpose solar collector (DPSC), enhances system efficacy.DPSCs capture solar radiation and convert it into heat, serving both water and air heating needs. These collectors typically consist of two sections: one for air heating and the other for water heating. By generating hot air and hot water simultaneously, DPSCs offer an efficient means of utilizing solar energy. They have been the subject of numerous studies, involving numerical simulations and experimental analyses, showcasing their potential to reduce energy expenses and greenhouse gas emissions.DPSCs find applications in residential, commercial, and industrial settings, offering simplified designs and minimal maintenance requirements. By employing DPSCs, elevated temperatures and thermal performance can be achieved while minimizing costs and spatial requirements. This article provides an overview of DPSC design configurations, applications, and the parameters influencing their performance, highlighting their role in advancing sustainable energy solutions.

Keywords: SolarEnergy,SolarWaterHeating,Flat-PlateCollector,SolarAirHeating,Dual-Purpose Solar Collector

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270. Semi-EmpiricalMethodtoApproximatethePoincaré-Lyapunov Constant for the Delayed-Liénard Equation

1.DR. MANIVASAHAM .A
2. Aarthi S,3. Anith Apel J

Abstract.
Time delay phenomena are prevalent across various fields, such as lasers, population dynamics, and neural networks. Understanding the bifurcations in systems with time delays often relies on rigorous mathematical frameworks like center manifold theory. A prominent example is the delayed-Liénard equation, where a significant bifurcation known as the Hopf bifurcation occurs.In this paper, we propose a semi-empirical approach to approximate the Poincaré-Lyapunov constant associated with the Hopf bifurcation in the delayed-Liénard equation. Instead of relying solely on analytical techniques, we utilize numerical solutions obtained at the critical value of the bifurcation parameter. Additionally, we employ a data-driven identification method to replace the traditional analytical center manifold reduction.By combining numerical simulations and data-driven approaches, our method offers a practical means of approximating the Poincaré-Lyapunov constant, providing insights into the behavior of systems exhibiting Hopf bifurcations in the presence of time delays. This approach can contribute to a better understanding of complex dynamical systems and their behavior under varying conditions.
Keyword: HopfBifurcation,CenterManifold,Time-DelaySystems,LeastSquaresFitting

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271. LiteratureReviewofVibroacousticSimulationinVehiclePower Transmission Systems for the Reduction of Radiated Noise

1. DR. MANIVASAHAM .A
2. Arockia Jenifer M,3. Deepalakshmi S

Abstract.
The radiated noise reduction of vehicular power transmission systems is one of the most activelyresearchedareas.Noisenotonlyimpactsthecomfortandsafetyofthedriverandpassengers butalsoregulatedbythelegislators.Thesimulation-basedpredictionofradiatednoiseofgear-drives is a rapidly evolving area and combines gear meshing models, finite element analysis, multibody dynamics and airborne noise simulation tools. The interfacing of these tools makes virtual noise prediction challenging. In this research, we conducted a literature review on vibroacoustic simulations, with a particular focus on reducing noise in power transmission systems. Based on the reviewed articles, it became evident that, although numerous measurement data are available, the usability of the data is limited. Most research focuses on individual stages of the structure and on smaller-sized powertrains. The measurement methods contain abundant valuable information; however, the literature lack of comprehensive articles that track the simulation process from the inception of excitation to body and air noises. Moreover, the majority of articles investigate the relationship between transmission error and NVH, considering it as a primary source of noise. New methodological approaches, such as the application of FEM meshes on gears, open new horizons in this domain. Throughout the literature review, we compiled potential noise-reduction solutions and highlighted directions for future methodology development research.

Keywords:GearboxNoise,PowertrainNoise,GearRadiatedNoise,GearboxNvh

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272. Predictive Maintenance and Fault Diagnostics of Automotive Steer-by-WireSteeringSystemsBasedonDigitalTwinMethod

1.MR.S.KARHICK

2. Dhinesh Babu C,3. Jaya Kamaksheradha S P

Abstract.
Planning vehicle maintenance is a complex task due to uncertainties surrounding failures and insufficient information about the actual condition of components. Typically, four levels of maintenance are recognized: reactive, periodic, condition-based, and predictive. Each level involves different strategies for managing maintenance activities.In steering systems, for instance, there may not be direct measurement methods available to assess their condition analytically. Instead, wear and increased friction may serve as empirical indicators that replacement is necessary. By understanding the different maintenance levels and their applicability to various vehicle components, maintenance planners can develop effective strategies to ensure vehicle reliability and safety while optimizing costs.

Keywords:FaultDiagnosis,PredictiveMaintenance,DigitalTwin,Steer-By-Wire,Maintenance

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273. ModelFittingforDeterminingtheParameterofthePoreSize Distribution

1 MR.S.KARHICK
2. Parkavi S,3. Premkumar S

Keywords: PoreSize,DistributionModelFitting

Abstract. The computation of the SWCC requires prior estimation of the pore-size distribution (POSD)whichiscomputedfromthePSD.Theprocessdescribedindetail by[1-3].Itneedsavalue of α which is a model parameter related to particle shape and orientation. On the basis of previous empirical data, the work by [4-6] suggests $1.3\leq\alpha\leq1.5$, while [1, 2] used $1.35\leq\alpha\leq1.39$for a smaller number of soil types. In this work our SWCC data measured on fractal sand mixtures were used. The Van Genuchten model was fitted then inverted [7-8], to have suction for a given water content. Then Least Squares fitting was made for the alpha, which had a smaller value around 1.The difference was tentatively explained by the fact that the measured data also deviated from the general measured SWCC-s, were shifted on the suction axis.

274. RefinementoftheFiniteElementModelfor Enhanced Structural Analysis

1.MR.S.KARHICK
2. Thamilarasi C,3.S.Trisha

Abstract.

In structural analysis, establishing a reliable finite element (FE) or analytical model is crucial for ensuring accurate results. However, there are instances where the dynamic response of a structure does not meet the desired requirements. In such cases, adjusting the model becomes necessary to rectify the discrepancies between the predicted and experimental data.

The focus of this paper is on the reanalysis technique, which involves modifying the dynamic characteristics of the structure to improve its dynamic response. This technique is particularly useful when load control is challenging, as it allows for adjustments to be made to the model parameters.Various techniques, including sensitivity analysis, are explored to understand how small modifications to the model affect its dynamic behavior. Sensitivity analysis helps identify which parameters have the most significant impact on the dynamic response, allowing for targeted adjustments to be made.The paper emphasizes the importance of considering the sensitivity of eigenvalues and eigenvectors to subtle changes in the model. By understanding these sensitivities, engineers can make more informed decisions when modifying the structure's dynamic characteristics.Overall, the reanalysis technique presented in this paper provides a systematic approach to improving the accuracy and reliability of FE models in structural analysis. By leveraging sensitivity analysis and other techniques, engineers can optimize the dynamic response of mechanical structures to meet desired requirements.

Keywords: Reanalysis,Eigenvectors,Eigenvalues,Sensitivity,FiniteElementMethod(FEM)

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275. Production Methods of High-EntropyAlloys

1.MR.S.KARHICK
2.R.VeeraKumar,3.S.Vellaisamy

Abstract.
High-entropy alloys (HEAs) represent an exciting frontier in materials science, characterized by their unique composition of five or more elements with significant concentrations evenly distributed in the crystal lattice. These alloys have garnered considerable attention due to their exceptional properties, including high tensile strength, corrosion resistance, and excellent heat resistance. HEAs hold great promise for applications in aerospace, automotive, energy, and various other industries.Computer-aided design methods, such as CALPHAD (Calculation of Phase Diagrams), are instrumental in the design and development of HEAs. CALPHAD enables the prediction of phase diagrams and other thermodynamic properties of alloys, aiding in the optimization of composition and manufacturing parameters before experimental work begins. Combinatorial and data-driven design strategies, along with machine learning techniques, are also being increasingly utilized to expedite the identification of promising alloy compositions and processing conditions.Manufacturing HEAs typically involves three main technology groups: melting and casting, powder metallurgy, and deposition techniques. Traditional methods like arc melting or induction melting face challenges in maintaining compositional integrity, especially when dealing with elements with disparate melting points. Powder-based technologies such as sputtering or mechanical alloying offer advantages like controlled grain size and uniform composition, facilitating the achievement of extreme material properties. Additive manufacturing, another promising technology group, enables the creation of complex geometries and local control of material properties using wire or powder for the manufacturing process.Optimizing the manufacturing process is crucial for achieving the desired properties of the final HEA product and meeting the requirements of specific applications. By leveraging advanced computational tools and innovative manufacturing techniques, researchers aim to unlock the full potential of high-entropy alloys for diverse industrial applications.

Keywords:AlloyDesign,MaterialsScience,ProductionMethods,High-EntropyAlloys

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276. InvestigationoftheAcousticallyExcitedBubble'sNonlinearShape Deformation in a Massive Parameter Range with GPUApplications

1.MR.S.KARHICK
2.S.Victorraj,3.V.Vishal

Abstract.

Sonochemistry is a field of active research that focuses on the phenomenon of acoustic cavitation induced in liquid media by periodic acoustic irradiation. This process generates vapor bubbles through cavitation, forming clusters where individual bubbles undergo radial pulsation, alternating between expansion and contraction phases. During the contraction phase, the pressure and temperature inside the bubbles can reach extreme levels, exceeding 1000 bar and 8000 K, respectively, depending on the applied parameters. These conditions often lead to increased chemical yields, making acoustic cavitation an attractive prospect for the chemical industry. However, challenges such as scalability and low energy efficiency hinder its widespread industrial application.To address the scaling difficulties, numerical simulation of bubble clusters across an extensive parameter space is necessary. This task is complicated by the nonlinear dynamics of bubble structures and the interactions between neighboring bubbles, which can merge or fragment under certain conditions. The dynamic balance between bubble merging and fragmentation must be maintained during numerical simulations.Modeling stable non-spherical bubble oscillations and defining the stability boundary between bubble merging and fragmentation remain challenging tasks. Describing non-spherical bubble oscillations requires solving a system of nonlinear coupled differential equations, where modes allowing deviations from spherical shape interact with each other. Previously, the authors developed a mathematical procedure embedded into the adaptive Runge-Kutta-Cash-Karp method, enabling efficient solution of the system of coupled implicit nonlinear differential equations on GPU applications.The current study aims to conduct a wide-ranging parameter study to further examine the convergence properties of the mathematical procedure and non-spherical bubble dynamics. By systematically exploring various parameters, the study seeks to enhance understanding of the behavior of bubble clusters and improve the accuracy and efficiency of numerical simulations in sonochemistry research.

Keywords: Cavitation,Sonochemistry,BubbleDynamics,GPU

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277. Manufacturing of 17-4PHSLMP arts with Different Scannin gAngles and Sample Orientations

1.MR.S.KARHICK
2.E.Hariharan,3.K.Hariharan

Abstract:

The study investigates the impact of scanning strategies and sample orientations on the densification, metallurgical, and mechanical properties of 3D printed 17-4PH samples. Scanning strategies and building orientations play crucial roles in influencing melting, reheating processes, and microstructural defects such as porosity in 3D printed parts.Various analyses were conducted, including optical and scanning electron microscopy, Vickers hardness testing, compression tests, and strength measurements to analyze the microstructure and mechanical properties of the samples.The results revealed that samples scanned at 90° with a sample orientation of 90° exhibited the highest proportion and largest size of pores, reaching 4.79%. Conversely, samples scanned at 45° demonstrated superior outcomes, achieving densification levels of 99.59% and 99.3% with sample orientations of 45° and 60°, respectively.Based on these findings, it can be concluded that scanning at 45° and 60° angles, along with corresponding sample orientations, yielded the best results in terms of densification, metallurgical properties, and mechanical strength. This suggests that these angles are optimal for both scanning and sample orientation in 3D printing of 17-4PH parts.

Keywords:17-4PH,AdditiveManufacturing,SelectiveLaserPrinting

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278.InvestigationofHeavyVehicleUnderrunningGuardFocusingforthe Energy Absorbing Issue

1.MR.S.KARHICK
2.D.Kavipriyan,3.R.Lingeshwaran

Abstract.
The importance of rear underrun protection devices (RUPDs) in heavy vehicles cannot be overstated, particularly in mitigating the severe risks associated with rear-end collisions. The absence of RUPDs could lead to fatal consequences for occupants of the rear-impacted personal vehicle, making their application imperative due to stringent safety regulations.RUPDs serve two primary functions: hindrance and energy absorption. Firstly, they act as barriers with sufficient strength and stiffness to prevent underrunning, thereby reducing the likelihood of fatalities by preserving the integrity of the passenger compartment during rear impacts. Secondly, RUPDs are designed to absorb impact energy, thereby extending the duration of the impact and reducing the deceleration experienced by occupants, consequently minimizing the risk of serious injury.The development or enhancement of RUPDs is a complex engineering task due to the need to balance energy absorption capabilities with strength requirements, often under constraints such as weight optimization. Various approaches can be considered, including shape-optimized crashbox structures, the use of advanced materials like aluminium foam, or a combination thereof.Aluminium foam, in particular, presents an ideal impact energy absorber due to its porous structure, which exhibits a stress-strain curve characterized by linear elastic behavior, a near-constant plateau range, and a densification zone. This allows for controlled deformation and efficient energy absorption during impact events, contributing to improved safety outcomes in rear-end collisions involving heavy vehicles.

Keywords: EnergyAbsorbing,UnderrunningPrevention,CrashboxAluminium,FoamAbsorber

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INTERNATIONAL CONFERENCE ON SOLID STATE MATERIALS APPLICATIONS AND FABRICATION TECHNOLOGY

279.Mechanical Characterization of Sustainable Mortar Based on a Prepared Sand and Superplastizier

1.MR.S.KARHICK
2.M.Pandian.3.S.Sangili

Abstract.
The utilization of industrial mineral additions like slag as a by-product in cementitious materials presents significant advantages in terms of both economy and environmental sustainability. While previous research has primarily focused on blending slag with Portland cement to enhance the properties of concrete, there is growing interest in substituting the inert fraction of sand with slag to improve the performance of cementitious mortars.In this experimental study, the mechanical behavior and durability of mortars based on locally prepared sand with slag additive and admixture incorporation are investigated. The study involves substituting a portion of the finer sand fraction (0.08-0.16 mm) with slag, up to 15%, while maintaining similar grain sizes to standard sand. Additionally, a superplasticizer, Medaflow SP 30, is incorporated into the mixtures at dosages of 0.5% and 1% by the weight of cement.The performance of the prepared mortars is compared to a reference mortar without additives made of normalized sand. The objective is to analyze the influence of slag addition on the mechanical response and durability of the mortars, particularly in aggressive environments such as solutions of H2SO4 and HCl.The results of the study indicate that the combined effect of replacing the finer fraction of sand with slag, along with admixture incorporation, is advantageous for formulating sustainable mortars. Significant improvements in mechanical properties are observed, with compressive strengths reaching around 40 MPa for slag dosages of 10% and 15%.Overall, the findings suggest that utilizing slag as a partial replacement for sand, coupled with the incorporation of admixtures, can lead to the development of high-performance and durable mortars suitable for various construction applications while promoting sustainability in the building materials industry.

Keywords: SlagAddition,Admixture,MechanicalProperties,Mortar,PreparedSand,Durability.

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280. **Design Optimization of In take Manifold for DualFuelIC Engine**

1.MR.S.KARHICK
2.M.SriKanth,3.D.Dhanasekaran

Abstract.

The article explores the design optimization of the intake manifold in dual fuel internal combustion engines to maximize fuel-air mixing and overall system efficiency. This optimization is crucial for achieving superior combustion performance and emission control in such engines. Through computational simulations and experimental testing, the research identifies key parameters that significantly impact intake manifold design effectiveness.The findings emphasize the importance of a well-optimized intake manifold in enhancing engine efficiency, combustion stability, and emissions reduction. By focusing on improving fuel-air mixing, the study demonstrates substantial improvements in engine performance, particularly in terms of emissions control and overall combustion efficiency.Furthermore, the article discusses safety design guidelines related to the intake manifold optimization process, highlighting the importance of ensuring the reliability and integrity of the system.Overall, this research contributes to ongoing efforts to enhance the performance of dual fuel internal combustion engines. It provides valuable insights and guidance for researchers and engineers involved in the development of innovative dual fuel system designs. By optimizing the intake manifold, the study aims to advance cleaner and more efficient transportation technologies, aligning with global initiatives for sustainable energy solutions.

Keywords: DualFuel,InternalCombastion, transportation technologies,duel fuel system

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281. Mechanical Testing and Orientation Optimalisation of 3DPrinted17-4PH Stainless Steel Alloy

1.MRS. SUGASHINI T

2.R.Dhivakar,3.P.Kannan

Abstract.
The research conducted focused on investigating the impact of different 3D printing orientations in Laser Power Bed Fusion (LPBF) technology, particularly for 17-4PH stainless steel. It was found that horizontal printing orientations are preferred due to the load being parallel to the planes of the deposited layers, which enhances strength.However, the study also considered the trade-offs associated with vertical printing orientations, which allow for more efficient use of the building platform and reduced post-processing effort but may result in reduced tensile strength due to the load acting perpendicular to the layers.The results indicated that the classical heat treament methods could exacerbate the disadvantages of vertical orientation, leading to increased brittleness. However, the "in-situ" treatment showed promise in improving the integrity of the layers, as evidenced by increased tensile strain values.Overall, the study highlights the importance of optimizing 3D printing orientations and post-processing techniques to achieve desired mechanical properties in additive manufacturing processes, particularly for materials like 17-4PH stainless steel.

Keywords:3DPrinting,StainlessSteel,PrintingOrientation,LaserPowerBedFusion

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282.PlasmaSurfaceTreatmentofAluminiumSheets

1.MRS. SUGASHINI T

2.M.Naveen,3.R.Santhosh

Abstract

. Your research focuses on the important issue of weight reduction in the automotive industry, driven by increasingly stringent emission regulations. Modern material combinations offer a promising solution for reducing vehicle body weight, but effective bonding technology is crucial for their successful implementation. Adhesive bonding emerges as a suitable technology for joining identical or dissimilar materials, especially when dealing with surfaces with varying conditions.Your experiments aim to investigate the physical, topographical, and chemical characteristics of surfaces to understand how they influence the quality of adhesion bonding. By exploring surface modification techniques, you seek to enhance the adhesion properties of materials in a deliberate and engineering-oriented manner. This research not only aims to modify surface physics and chemistry but also to bridge the gap in the international literature regarding the relationship between surface modification of raw materials and bonding technology. Specifically, you aim to elucidate the specific physical and chemical processes involved, their duration of action, and their role in bonding technologies.By filling this scientific gap, your research will contribute valuable insights into optimizing adhesive bonding processes for weight-reduced automotive components, ultimately aiding in meeting emission regulations and advancing engineering solutions for the automotive industry.

Keywords: SurfaceTreatment,Aluminium

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283.ComprehensiveMeasurementandSimulationofPrototypeInjection Moduls

1.MRS, SUGASHINI T

2. Thiruppathi C,

Abstract.
Your research focuses on the dynamic development of the injection molding industry, particularly the increasing demand for customizable products through low or middle volume production using prototype molds and inserts. Aluminum is the conventional material for prototype molds due to its excellent machinability, acceptable strength and stiffness, and outstanding thermal conductivity.Your analysis involves studying operational strains, cavity pressures, and temperature distributions in the prototype molds. Additionally, you have applied finite element mechanical simulation to model the operational state of these prototype molds with satisfactory accuracy. This approach enables a deeper understanding of how various factors affect the performance and behavior of prototype molds during the injection molding process.Overall, your research contributes valuable insights into optimizing the design and performance of prototype molds, ultimately enhancing the efficiency and effectiveness of injection molding processes in the industry.

Keywords:RapidTooling,StateMonitoring,InjectionMoulding,Simulation,FiniteElement Modeling

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284.BubblesandProducingAmmonia

1.MRS. SUGASHINI T

2. Angel Epsiba A,3. Arul Roseline A

Abstract

Your research focuses on finding an alternative and more energy-efficient method for producing ammonia, which is currently produced using the energy-intensive Haber-Bosch process. Your proposed method involves generating bubbles containing hydrogen and nitrogen, then subjecting them to pressure changes to induce oscillation. During these oscillations, the conditions inside the bubbles become favorable for ammonia production. The goal is to optimize the parameters of this process to maximize energy efficiency.You use a modified Keller-Miksis equation, extended with chemical reaction equations, to describe the radial oscillation of the bubbles. This results in a system of ordinary differential equations, which is solved numerically using MATLAB due to the nonlinear and stiff nature of the system. The parameters investigated in your simulations include the equilibrium radius of the bubble, the initial expansion magnitude, the ambient pressure, and the initial mole fraction of hydrogen.Your results show that decreasing the ambient pressure and slightly reducing the initial mole fraction of hydrogen can improve energy efficiency in most cases. In the best scenario, your proposed method achieved a 6.78-fold increase in energy efficiency compared to the Haber-Bosch process. However, you note that energy efficiency depends on additional parameters such as liquid and pressure excitation properties, suggesting that further optimization could lead to even greater improvements.Overall, your research offers promising insights into a novel approach for ammonia production, potentially offering significant energy savings compared to conventional methods. Further exploration of parameter variations could enhance energy efficiency even further, making this method a valuable alternative in the production of ammonia.

Keywords: Sonochemistry,BubbleDynamics,Ammonia,Haber-Bosch-Process,EnergyEfficiency

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285.ParticularAspectsRegardingtheRadiativeHeatTransferinThermal Analysis of Steel-Concrete Composite Structural Elements.

1.MRS. SUGASHINI T

2. Asarudheen K,3. Barakkath Nisha S

Abstract.

In a coupled analysis of steel-concrete composite structural elements, radiative heat flux plays a crucial role in heat transfer. However, many existing methods for modeling radiative heat flux rely on prescriptive values of surface thermal properties, which may not accurately account for the specific geometry and effective thermal properties of the participating medium. These simplifications, while facilitating the mathematical modeling process, may lead to overestimation of the actual heat transferThe present study aims to establish quantitative and qualitative assessements of radiative heat flux in two scenarios. Firstly, it investigates radiative heat transfer between a flame and a solid surface, which is essential in the thermal analysis of composite structural elements. This evaluation considers the thermal properties of the flame, including the influence of soot. Secondly, the study examines radiative heat transfer between two parallel solid surfaces, which is relevant for modeling thermal discontinuities between materials such as steel and concrete.The study seeks to evaluate both thermal and geometric parameters that affect radiative heat flux across a range of temperatures. Additionally, it compares various approaches with standard formulations to assess their accuracy and effectiveness. Furthermore, the study aims to analyze variations in radiative heat flux, particularly focusing on temperatures specified by the ISO-834 standard fire curve.By conducting these analyses, the study aims to provide a more comprehensive understanding of radiative heat flux in composite structural elements. This improved understanding can lead to more accurate thermal analyses and ultimately enhance the design and safety of steel-concrete composite structures, particularly in fire scenarios.

Keywords: Radiative Heat, Flux Coupled Thermal, Analysis Participating, Medium Steel-Concrete Composite Elements

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206. AComparativeStudyofthePredictiveCapabilitiesofSVMandRSMfor Estimating Heat Treatment Parameters

1.MRS. SUGASHINI T

2. Brundha P

3. Chinnadurai R

Abstract:
This work presents a new statistical study on the influence of heat treatment parameters on the mechanical properties of C45 steel, as well as on the predictive modeling of these properties using the Support Vector Machine (SVM) method. The results of the analysis of variance (ANOVA) reveal that the cooling medium has a significant impact on tensile strength, hardness, and elongation, contributing 47.34%, 49.16%, and 74.3%, respectively. Furthermore, the heating temperature also exerts an influence, with contributions of 13.27%, 17%, and 1.99% for these same properties. In parallel, the mathematical models developed using the SVM approach prove to be extremely effective for predicting new results even with small datasets.

Keywords: Modeling;SVM;RSM;HeatTreatment;MechanicalProperties.

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287. ANewConceptofn-DimensionalMachineDesign

1. MS. J. DEEPIKA
2. Deepika P,3. Dheetsika V

Abstract.

Every industrial product must be adapted and harmonized with existing or potential needs across various areas of human activity. Basic sciences precede technical sciences, which then lead to product development, encompassing engineering design and related activities. Upon completing the engineering design, the product undergoes manufacturing using appropriate production technologies. Art, particularly through industrial design, is more or less incorporated into product development, depending on the product type. Notably, the state and dynamics of product development are influenced by the social and economic situation, as well as politics, creating an environment for all these activities. Otherwise, realized products significantly impact each of these areas of society and civilization development. A product life cycle comprises the following main stages: Problem/Need/Market and Company Goals/Potencial; Product planning; Design/Development; Parts production/Assembly/Testing; Marketing/Sale; Use/Maintenance; and Energy recovery/Recycling/Disposal. The main steps of product design and development include: Task setting; Concept design/Synthesis; Selection of shapes, dimensions, and materials; Analysis/Simulation/Optimization; Corrections/Modifications; and Detailed drawings. In the Architecture, Engineering, and Construction (AEC) industry, there is a concept known as Building Information Modeling (BIM), which has undergone significant development over the past fifteen years. It represents a modern approach to the design, documentation, delivery, and lifecycle management of buildings by utilizing project databases in conjunction with object-based parametric modeling. The primary aim of this work is to propose a comprehensive methodology for Machine Information Modeling (MIM) to the scientific community in the field of machine design. It also aims to initiate the development of a complex methodology tailored to all aspects of machine design while incorporating valuable elements from BIM. Certain aspects similar to BIM principles are already present in machine design and manufacturing, though they have not been systematized and standardized or unified, as they have in the AEC sector. Our current main focus is on a multidimensional (nD) modeling approach to MIM. It is necessary to create a very complex information system that would contain all the mentioned dimensions (or new ones that will inevitably emerge with industrial development) and provide instructions for their incorporation into machine design. This is impossible without the application of modern information and communication technologies (ICT), the utilization of powerful digital resources, and the integration of artificial intelligence. Additionally, it is essential to include the process of standardization and the publication of appropriate standards for the realization of n-dimensional design, similar to those for BIM, as well as using the unique aspects of machine design, which lead to original MIM. The number of dimensions is theoretically infinite. The greater the amount of information we incorporate into a model, the more dimensions we can generate!

Keywords:MachineDesign,ProductDevelopment,ProductLifeCycle,N-DimensionalDesign

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288. EvaluationofMachineLearningAlgorithmforFacialRecognitionandIts Applications

1.MS. J. DEEPIKA
2.Dinesh M,3. Gnanasamuel A

Abstract.

In recent times, machine vision and facial recognition have become increasingly integrated into our daily lives. Whether it's unlocking mobile devices, capturing camera documentation, or enabling autonomous drives, machine vision has undeniably become a prominent feature of the modern world. With such promising technology, there is little reason not to adopt and utilize facial recognition widely, as evidenced by its presence in the market today. Major tech companies like Apple, Samsung, and Google already offer biometric encryption via facial recognition for securing their mobile phones.While the methods employed in this paper may not be as advanced as those used in the current industry, they demonstrate that enthusiasts outside of the industry can also utilize such tools. With open-source programs like OpenCV, facial recognition software can be developed and implemented at home with minimal effort or expense. Furthermore, these free open-source software packages could not only be utilized for simple passion projects but also serve educational purposes in classrooms.

Keywords: ComputerVision,FacialRecognition,OpenCV,MachineLearning

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289. ImpactofBallBearingGeometryandOperationalLoadontheVolume of the Lubricant in the Bearing's Loaded Zone

1. MS. J. DEEPIKA

2. Jaisurya K,3. Jenani R

Abstract

This paper presents a mathematical model for determining the quantity of lubricant in contact between balls and raceways of a deep groove ball bearing. In a deep groove ball bearing, balls are involved in transferring the load from one ring to another as they pass through the contact zone. In this process, the balls are in mutual elastohydrodynamic lubrication (EHL) contact with the raceways. Within the EHL contact between the balls and the raceway, there exists a certain amount of lubricant between the contacting surfaces. The volume of lubricant in contact can be calculated as the product of the contact zone's area multiplied by the thickness of the lubricant film between them. The relationship between the lubricant volume VLq (where q = 1 for ball-outer ring contact and q = 2 for ball-inner ring contact) within the contact zone and the relative radial clearance e/δ0 (where e represents radial clearance and δ0 represents contact deformation between the ball and raceway) as well as the relative operational load FR/C (where FR is the operational load and C is the bearing dynamic load rating) of the deep groove ball bearing 6206 can be established.By knowing the quantity of lubricant volume VL within both contact zones, it becomes possible to estimate the concentration of contaminating particles entrapped in the contact between balls and raceways. This estimation can be correlated with the overall known concentration of abrasive particles within the bearing lubricant. Through this approach, it becomes feasible to assess and predict the level of abrasive wear occurring within bearing components during operation.

Keywords: BallBearing,LoadDistribution,EHL,BearingLubricantVolum

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290. **TestingSurfacePropertiesof3DPrintedMetals**

1.MS. J. DEEPIKA
2.Kannan M,3. Karthikraja M

Abstract.

The rapid development of additive manufacturing technologies has opened novel opportunities for producing metal components with a variety of uses. 3D printing of metals provides the capability to produce parts with complex geometry and offers design freedom that cannot be achieved through conventional methods. This is why 3D printed metal parts are increasingly finding applications in areas such as automotive, aerospace, and tool manufacturing. Surface properties of 3D printed metal components are of great importance for the functionality of machine systems, particularly as they often operate under conditions where contact stresses occur.Currently, there is only one standard that deals with the measurement and characterization of the surface texture of 3D printed metals – ASTM F3624-23. Generally, methods for testing surface properties are divided into two groups: non-destructive and destructive methods. The most commonly used non-destructive methods for determining surface roughness include SEM, EDS, and XRD analysis. Additionally, ultrasonic, thermographic, laser, atomic force microscopy (AFM), X-ray, magnetic, and eddy current methods (ETC) can be applied, although their limitations must be considered. Post-processing methods are typically employed to reduce the roughness of parts. For instance, shot peening has been shown to reduce up to 50% of the average surface roughness for stainless steel 316L.Tribological properties are crucial in cases where contacting parts are in relative motion. To determine tribological properties, well-known testing methods are adapted for 3D printed metals. Dry erosion, slurry erosion, and high-stress abrasion tests on stainless steel 316 are among the most commonly used. Testing procedures outlined in ASTM B611 and ASTM G65 standards are applied for determining wear properties of 3D printed cemented carbide, although this material is not metal, these procedures can be adapted for use with 3D printed metals.

Keywords: Tribology,Wear,TestingMethods,3DPrintedMetals

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291. Treatment of Polluting OilDrilling Waste, Proposalofa Green Economy Process, Drill Cuttings Case

1. MS. J. DEEPIKA
2. Kavin J,3. Kayathri S

Abstract

During oil drilling, the generated polluting drill cuttings are typically treated through stabilization/solidification using a cement-based hydraulic binder. Subsequently, these treated cuttings are often buried in the environment without recovery or economic consideration. The environmental challenge posed by increased oil production is the growing generation of contaminated drill cuttings, which pose a threat to marine and land ecosystems. If drilling sludge is treated and recycled, it presents a potential solution to mitigate this issue. However, drill cuttings containing various forms of organic and metallic pollution, typically originating from underground rocks, remain a significant environmental concern.In an effort to address this problem, our investigation focuses on several objectives aimed at not only reducing the quantities of pollutants in the environment but also exploring their potential value. The primary objective of our study is to develop an optimized original cement formulation that can be utilized in the production of cement-based building materials. This formulation involves a blend of CEMII/A 52.5 cement with previously stabilized drill cuttings, combined with a superplasticizer to influence the rheological characteristics of the mixtures. The aim is to approximate the rheological properties based on cement alone, thereby enhancing the usability of the resulting materials.

Keywords:drillcuttings-Petroleum-Solidification/Stabilization-Cementing

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292. Optimizing the Geometric Design of a Helical GearthroughSimulation and Surface Roughness Measurement Analysis

1. MS. J. DEEPIKA
2. Kayathri S.3. Kishore M

Abstract.
Gearing systems, particularly helical gears, are renowned for their efficiency in transmitting rotary motion and power between shafts. They excel in load-bearing capabilities, noise reduction, and offer versatile speed adjustments. However, they encounter several challenges, primarily related to tooth root failures and surface pitting during the design process.To enhance the performance of helical gears, this study focuses on optimizing their geometrical design and efficiency by selecting the most favorable parameters for the driven gear, especially its helical teeth. A real helical gear will be measured, and its parameters will be modified accordingly using SolidWorks. Additionally, a complementary opposite hand pinion will be selected to align with the designed gear for further static analysis.Simultaneously, surface roughness measurements will be taken and analyzed to determine strategies for reducing losses, improving performance, selecting suitable materials, and extending gear life. Once the optimal design for the gear pair is established, Finite Element Method (FEM) analysis will assess stress distribution and contact patterns, predicting gear behavior under various loads and conditions.

This research aims to contribute to the development of efficient and durable gear systems, benefiting industries such as automotive, aerospace, and industrial machinery applications.

Keywords: Surface,Design,Static,Gear,Helical,Optimization

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293. Object-CentricProcessMiningforInspectionandMaintenanceError Detection in Sustainable Manufacturing

1.MRS.N.REVATHI
2. Lalitha K,3. Madhan S

Abstract

In the pursuit of sustainable manufacturing processes, techniques for inspecting and maintaining often rely on subjective analysis and assumptions derived from manufacturing process models, which typically focus on individual object types. While traditional methods for improving these processes may be effective, they do not always result in quick enhancements in efficiency and sustainability. In reality, there is often a disconnect between the perceived solutions from manufacturing process modeling and the actual error detection during inspection and maintenance, leading to discrepancies across both time and space.Object-centric process mining (OCPM) presents a groundbreaking and comprehensive approach for analyzing and improving sustainable inspection and maintenance error detection in manufacturing processes. OCPM goes beyond the limitations of a single-object focus by considering multiple object types and events, thus encompassing the complexities of 3D space and time. Adopting an object-centric perspective provides organizations with a multidimensional understanding of their processes, enabling the identification of root causes underlying performance and compliance issues.This study investigated the potential of OCPM to enhance inspection and maintenance error detection within the context of sustainable manufacturing, ultimately aiming to contribute to increased efficiency and sustainability.

Keywords: Inspection and Maintenance, Object-Centric Process Mining, Error Detection, Classification.

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294.DamageAnalysisonToothGearRingofaBucket-WheelExcavator

1.MRS.N.REVATHI
2. Jaisurya K,3. Lalitha K

Abstract

This paper addresses the damage analysis of gear rings immediately following the manufacturing process, just before entering the in-service period. The tooth gear ring segments were fabricated from 40MnCrSi3V low-alloyed cast steel, with their chemical composition and mechanical properties provided in Tables 1 and 2, respectively.Due to the nature of the parent material, in this case, low-alloyed cast steel 40MnCrSi3V, it was necessary to conduct inspection and control of the gear segments after manufacturing. A non-destructive testing method utilizing magnet particles (MT) of a fluorescent suspension with particle size 2 μm was employed to detect potential defects. Surface indications were observed on 8 out of 12 gear segments, where the lengths of the cracks extended up to 110mm. Some of the observed defects are depicted in Fig. 1. These defects were located in various parts of the gear segments, including the main body and teeth.Based on the observations, it was determined that the defects on the new gear ring segments were caused during the manufacturing process, specifically by the casting process and inadequate cooling rates.

Keywords: DamageAnalysis,Gear,Bucket-WheelExcavator,Low-AlloyedCastSteel

295.FractureAnalysisofCompositeBeamElement: Case Study

1.MRS.N.REVATHI
2. Manikandan M,3. Mohamed Anas J

Abstract

This paper presents a fracture analysis of a composite beam element through an in-depth case study, focusing on its application within an unmanned aerial vehicle (UAV). The composite beam serves as a structural component of the UAV and is expected to possess high strength and lightweight characteristics. However, such elements are vulnerable to various forms of failure under different loads and operating conditions. The objective of this case study is to identify and analyze the factors leading to the fracture of the composite beam and understand the fracure mechanisms.Given the absence of clearly defined forms and regulations for UAV design, and the potential for unexpected load scenarios during testing and flight performance, understanding fracture mechanisms becomes crucial. Additionally, weight is a critical factor in aviation, making oversizing the structure unfavorable.The fracture under investigation in this study occurred during the aircraft's descent after takeoff. To comprehend this fracture, the research involves a thorough analysis of flight parameters recorded prior to the descent. This analysis is essential for establishing the load profile and replicating the precise load conditions that led to the fracture. Furthermore, the research methodology extends to encompass a wide-ranging examination of numerical and experimental data derived from real-world engineering scenarios. Beam and specimen analyses explore various factors contributing to structural failure, including forms of fractures such as delamination, cracks, and material fatigue.The results of this case study provide a deeper understanding of fracture mechanisms in composite structures, enabling engineers to enhance the design of composite parts for UAVs. Establishing this methodology can have broad applications in the aerospace industry, the automotive sector, construction, and various other fields where composite materials are utilized.Through this analysis of composite beam fracture, this study contributes to enhancing the safety and reliability of composite structures, particularly in the design of unmanned aerial vehicles, while also enriching the data in this field and having broad applications in various engineering contexts.

Keywords: Compositematerials;UAV;DesignRequirements;FiniteElementAnalysis

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296.InvestigatingtheMechanicalPropertiesofPVCBasedTernaryBlends

1.MRS.N.REVATHI
2. Mohamed Aslam S,3. Mohamed Anas J

Abstract

Polymer blending is a method used to create new materials with a wide range of properties by combining existing polymers. The properties of these polymer blends are influenced by several factors, including the composition of the blends. The objective of this research is to investigate the mechanical properties of PVC/TPU/Bio plasticizer systems prepared using the roll milling process at various mixing ratios.Dynamic mechanical analysis (DMA) was employed to study the compatibility of the blends. The results indicated that blends of PVC/TPU/Bio plasticizer, PVC/TPU, PVC/Bio plasticizer, and TPU/Bio plasticizer are miscible across all compositions. Hardness measurements and tensile tests were conducted to assess the mechanical properties.It was observed that the hardness decreased with increasing bio plasticizer content in the PVC/Bio plasticizer and TPU/Bio plasticizer blends. Additionally, the hardness of PVC/TPU blends decreased with increasing TPU content. The tensile strength of PVC/Bio plasticizer, PVC/TPU, and TPU/Bio plasticizer blends also decreased with the content of the second component.Furthermore, the blend composition influenced Young's modulus and elongation at the break. The elongation at the break of blends increased with the bio plasticizer content. Similarly, Young's modulus of PVC/TPU decreased with increasing TPU content due to TPU's elastomeric properties. Interestingly, incorporating 20 phr of TPU into the PVC/Bio plasticizer 100/50 blend increased elasticity and elongation at the break without significantly compromising tensile strength. This suggests that small changes in the TPU composition can effectively enhance the required properties for specific applications. Moreover, these polymer blends were found to be miscible and technologically compatible, making them suitable for industrial applications.

Keywords:PVC,TPU,DynamicMechanicalAnalysis(DMA),TensileTests,Mechanical Properties

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297.Advancements and Technological Optimization in Yacht Design Osmosis Treatment and Rehabilitation

1.MRS.N.REVATHI
2. Monika Sri B,3. Nandha Kumar R

Abstract

Our presentation will delve into innovative solutions for yacht rehabilitation, with a primary focus on mitigating osmosis and the detrimental impact of seawater, microorganisms, and biomass solidification on yacht hulls and rudders. Through meticulous technological processes, including blister treatment, epoxy coatings, and the application of 'Anti-Osmosis paints,' this research aims to achieve a positive outcome where yachts not only fully recover but also strengthen, preparing for continued voyages.This article will provide invaluable insights to stakeholders invested in the longevity, performance, and sustainability of yacht designs. It offers transformative approaches to address and overcome these design challenges. Relevant design-enhancing materials have been applied, and the technological process has been optimized in a staged methodology, enabling the complete restoration of the yacht.The knowledge gained from this research is directly applicable in practice and is useful for interested parties, including yacht owners, companies, and individuals involved in both conventional and advanced yacht design.

Keywords:Design,Osmosis,TechnologicalOptimization,Yacht,Rehabilitation

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298.AReview of Aerodynamic Analysis of Commercial Automotive-Materials and Methods

1.MRS.N.REVATHI
2. Prasanna M,3. Robinson R

Abstract
This paper explores the role of computational fluid dynamics (CFD) modeling techniques in the aerodynamic design and propulsion system of Formula 1 cars. It provides a study of Reynolds number influences on the state of the boundary layer, unstable and steady flow, time-dependent wake structure, interacting shear layer, and separate flows through literature review. As pointed out in this paper, aerodynamics analysis is conducted to decrease the drag force. Computational fluid dynamics (CFD) tools were used for the analysis. The major objective of this review article is to increase the car stability and reduce drag, ultimately enhancing track efficiency and reducing air resistance of the vehicle. The ideas of dimensional analysis and uniformity of flows are utilized to demonstrate that commercial ground cars' aerodynamics are only dependent on the transitional and trans-critical flow regimes.

Keywords: DragForce,LiftForce,ComputationalFluidDynamics(CFD),WindTunnel,Vortex,Wake

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299.ProduceFoamGlassAggregateUtilizingWasteGlassfrom Cathode-Ray Tubes

1.MRS.N.REVATHI
2. Robinson R,3.Monika Sri B

Abstract
Foam glass aggregate, typically derived from recycled glass, is a lightweight material renowned for its exceptional insulation properties, low weight, and resistance to water and chemicals. It is produced by blending powdered glass with a foaming agent and subjecting the mixture to high temperatures, resulting in a structure filled with numerous small, enclosed glass bubbles. Due to its insulation, drainage, and load-bearing advantages, foam glass finds extensive application in construction and civil engineering projects.In this study, foam glass was prepared using cathode ray tube (CRT) waste glass and silicon carbide as a foam agent at a concentration of 1wt%. CRT waste glass refers to the glass found in older television and computer monitors, which become electronic waste upon disposal. Proper recycling and disposal of CRT waste glass are crucial due to the hazardous materials it contains, such as lead. Recycling CRT waste glass not only helps recover valuable materials but also prevents the release of harmful substances into the environment, addressing both environmental and health concerns.The mixture of waste glass and silicon carbide was subjected to testing with a heating microscope to determine the foaming temperature and maximum height of the samples during heating. It was observed that the foaming temperature is approximately equal to the maximum height that can be achieved. The mixture exhibited a foaming temperature of 800°C with a higher foaming height of 119%. Subsequently, the density, thermal conductivity, compressive strength, and water absorption of the foam glass were measured at different foaming temperatures (725°C, 750°C, 775°C, and 800°C).The study revealed that as the foaming temperature increased, the density, volume expansion, and pore size of the material increased, while the thermal conductivity decreased. This indicates the potential for optimizing the properties of foam glass by adjusting the foaming temperature during the manufacturing process.

Keywords: CathodeRayTube,WasteGlass,FoamGlass,FoamingTemperature

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300.Comparative Analysis of WettabilityofMetalsandCeramicsbyOil

1.MR. RAJKIRAN
2. Prasanna M,3. Nandha Kumar R

Abstract
The transportation of liquids, such as crude oil, through metal conduits like steel pipes, is integral to numerous industries. However, frictional forces acting on these liquids as they flow through metal conduits decelerate the flow velocity, leading to the removal of metal layers and eventual corrosion, potentially compromising equipment integrity. This issue is particularly significant with crude oil due to its impurities and water content, exacerbating the interaction with metal surfaces. Therefore, addressing this challenge is crucial for equipment preservation, reducing maintenance costs, enhancing operational efficiency, and extending infrastructure lifespan across various industries.The primary objective of this review is to examine previous research efforts focused on enhancing liquid (especially oil) wettability on metal surfaces and assessing the feasibility of improving corrosion resistance by controlling oil wettability levels and enhancing metal surface properties while considering various operational conditions. Additionally, actionable recommendations and suggestions for future planning are provided to mitigate the deleterious effects of corrosion on equipment and infrastructure, promoting sustainability, reducing maintenance costs, and ensuring the reliability of machining systems crucial to various industries.The experimental part involved testing different oil types (Glycerine, Hydraulic oil (Hydro HME10), and Petroleum) on metal and ceramic surfaces (Ag, Al, Cu, Sn, TiC, and WC). The average surface roughness (Ra) of the substrates was measured using a MARSURF M400 Surface Roughness Measuring Instrument. The change in contact angles of oil droplets was recorded and measured for 5 minutes for each sample using KSV software, and the results were analyzed.The main observations indicate that petroleum exhibited better wettability than other oils on all types of substrates. For example, on TiC surfaces, the contact angle of petroleum was lower (Θpetroleum = 8°) compared to hydraulic oil (ΘHydraulic = 12°), and this improvement was consistent throughout the testing period. Additionally, it was observed that the contact angle of oils increased with the atomic radius of the pure metal substrate.

Keywords: Wettability,SurfaceTension,Anti-Corrosion,OilSeparation.

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301.Shopfloor-LevelMaterialFlowAnalysistoDeterminetheReadinessofa Company for Industry 4.0

1.MR. RAJKIRAN
2. Robinson R,3. Manikandan M

Abstract
The advent of the fourth industrial revolution has prompted companies to prioritize the digitization of their processes. Through digitization, they can establish cyber-physical systems wherein interconnected components can autonomously make real-time decisions based on collected and processed information. However, achieving this requires equipping process elements with various sensors and actuators and ensuring seamless communication and data transfer among them. Technologies emerging from Industry 4.0, such as the Internet of Things and cloud computing, address these challenges.Within the realm of Big Data, it is crucial to determine the data that must be collected and how it can be effectively stored and utilized to optimize productivity efficiency in operations. Today, artificial intelligence applications are already capable of optimizing material handling tasks or predicting maintenance needs resulting from operations.To establish a cyber-physical system that fully supports a company's production processes, it is essential to gather the right information about each process. This entails utilizing different identification and tracking solutions.In the context of manufacturing companies, tasks associated with material flows are often viewed as necessary but non-value-creating processes, characterized largely by dynamic information. Therefore, this study focuses on material flow processes at the shopfloor level to assess companies' readiness for digitization at this level. The objective is to identify segments worth investigating within the value-creating processes. Additionally, the study aims to evaluate the existing Industry 4.0 readiness and maturity levels.

Keywords: Digitization,Industry4,Intralogistics

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302.Fractal Fractiona Analysis and Numerical Simulation for theHeat TransferofZnO+Al2O3+TiO2/DWBasedTernaryHybridNanofluid

1.MR. RAJKIRAN
2. Lalitha K,3. Kayathri S

Abstract.
Nanofluids are utilized to maximize thermal performance while maintaining a minimal concentration of nanoparticles and ensuring stable suspension in conventional fluids. The heightened thermophysical characteristics of nanofluids significantly impact their effectiveness in convection processes. Expanding on this technology, binary and ternary nanofluids are now employed to enhance the efficiency of regular fluids. Hence, this paper aims to investigate the natural convection of a Newtonian ternary nanofluid flow within a vertical channel.The ternary nanofluid comprises nanoparticles of zinc oxide (ZnO), aluminum oxide (Al_2O_3), and titanium oxide (TiO_2) dispersed in the base fluid, distilled water (DW), forming a homogeneous suspension. Additionally, the influence of thermal radiation, joule heating, and viscous dissipation are taken into account. The classical Newtonian ternary nanofluid model is extended using the Fractal-fractional derivative (FFD) operator. This generalized model is then discretized using the Crank Nicolson scheme and solved using computational software.
The obtained solution is numerically computed to analyze fluid flow behavior and heat distribution in response to various physical parameters. Notably, when the volume fraction (φ) reaches 0.04 (4% of the base fluid), the ternary nanofluid flow exhibits a substantial enhancement in heat transfer rate compared to binary and unary nanofluid flows. This improvement in heat transfer rate enhances the thermophysical characteristics, such as viscosity, thermal expansion, and heat capacity, of the base fluid. It is also observed that the thermal field is enhanced with higher values of the Eckert number (Ec), radiation parameter (Rd), and joule heating parameter.

Keywords: TernaryNanofluid,DistilledWater, Joule Heating, ViscousDissipation, Fractal Fractional Derivative, Crank Nicolson Scheme.

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303.DesignandModelofPortableGantryCraneMachine

1.MR. RAJKIRAN
2.B.Roshini,3.P.Santhoshkumar

Abstract

This project focuses on the design and modeling of a portable gantry crane machine intended for use in workshops, garages, and other overhaul facilities. The primary issue addressed is the absence of a lifting and transporting mechanism for heavy machine parts such as engines, differentials, and suspension systems. Currently, these parts are handled manually, leading to reduced production rates, compromised quality, and safety concerns. To resolve these issues, the paper proposes the use of a chain hoist mechanism driven by an AC three-phase induction motor combined with a chain drive system and four wheels. The main goal of the paper is to provide detailed engineering designs, material selection, and design of mobile parts for the portable gantry crane, which utilizes electric power and manual operation to simplify the lifting and transporting process. The focus lies on detailed component design using various software tools such as CATIA V5 for part drawing, SolidWorks 2018 for assembly drawing, and ANSYS 16 for static analysis. These tools help in testing bending moments, stresses, and different forces acting on the machine, as well as its process and maintenance activities.The project on the portable gantry crane was conducted primarily through observation in garages, industrial workshops, and reference to different books. As a result, a portable gantry crane machine with high torque and speed obtained from the motor speed using a chain drive mechanism at low operating costs is designed. The machine has a maximum carrying capacity and lifting height of 3 tons and greater than 2.75 meters from the ground, respectively, powered by a 1.5 kW electric motor rotating at 1200/600 rpm.The maximum principal stresses in each component tested were found to be below the yield stresses of the respective components, indicating that under normal operating circumstances, these components should not fail. The implementation of this design is expected to have major positive benefits for the economy by decreasing import expenses and protecting the natural environment through the use of an electric system rather than a fuel system.

Keywords:PortableCrane,Lifting,VerticalColumnBar,CraneWheels

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304.LongitudinalDynamicModelingofElectricVehiclebyUsingMatlab Simulink

1.MR. RAJKIRAN
2. Sathishkannan S,3. Sebasthiyan S

Abstract.
The article discusses the longitudinal modeling and simulation of a generic electric vehicle. Its main objective is to outline the modeling procedures and their solutions in Matlab. Additionally, the aim is to establish a framework for a Matlab Simulink model that enables future optimization and ensures modularity. This approach is designed to foster collaboration among different research groups working on similar projects.

Keywords: Matlab,DrivingCycle,Modeling,Vehicle,WLTP,Optimization,Modularity

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305.Computational FluidDynamics Simulation oftheCoolingofaVehicle Alternator's Stator Winding

1.MR. RAJKIRAN
2. Stephen S,3. Subashini M

Abstract.

The paper investigates the cooling of a passenger car alternator's stator winding using computational fluid dynamics (CFD). As the demand for accurate simulation of physical processes in alternator operation grows, efficient product development becomes crucial for remaining competitive. An accurate numerical model can reduce testing iterations and optimize product design by offering a deeper understanding of system behavior. Initially, the CAD model is simplified to facilitate fine-quality numerical mesh generation while retaining key geometric features affecting results. Heat sources, mainly the stator winding and diodes, are identified, and their heat loss is calculated and input into the CFD software. Mesh, time-step size, and flow volume independence studies are conducted.Two primary approaches in computational fluid dynamics for rotating machine modeling are explored: a steady "frozen rotor" approach and a transient "moving mesh" approach. A comparison between these approaches is presented. Transient simulations are performed at multiple operating points, and results are evaluated through velocity, pressure, and temperature contours, as well as streamlines and quantitative properties such as mass flow rate and body temperatures. Experimental comparison demonstrates good correlation between simulated and measured data, with potential deviations discussed. The paper concludes by outlining the future applications of the simulation model.

Keywords: Thermal, Rotating Machinery, Cooling, Claw-Pole Alternator, Automotive Alternator, Computational Fluid Dynamics (CFD)

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306.IntegratingMetaheuristicOptimizationintoNumericalSimulation

1.MR. RAJKIRAN
2. Stephen S,3. Sujhin R

Abstract

The research aims to develop a robust optimization algorithm suitable for integration into existing design processes with minimal modification, enabling seamless application to multivariable design problems. Metaheuristic search methods are chosen for their efficiency and versatility in tackling complex real-world problems.Metaheuristics are advanced search algorithms capable of quickly and efficiently finding relatively good solutions. They offer algorithmic frameworks applicable to diverse problem sets with minimal modification, often combining local and global search strategies to explore the search space effectively while avoiding local minima. While metaheuristics may not guarantee finding global optima, they often outperform other algorithms.Particle Swarm Optimization (PSO) is selected as the metaheuristic for further research. Inspired by swarm behavior in nature, PSO is widely used due to its flexibility simplicity. It has diverse applications, including teaching neural networks, restructuring electricity networks, and various design optimization tasks. PSO shows promise for problems where other algorithms fail or specific search procedures are unavailable.In PSO, particles move through the search space in a quasi-stochastic manner within a swarm. The algorithm iterates through cycles, during which particle positions are updated using a velocity function. This function comprises deterministic and stochastic components, with particles influenced by the global best position and their own best position, balancing exploration and exploitation of the search space.

Keywords:FEMNumericalSimulation,Optimization,Metaheuristics,ParticleSwarm Optimization

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307.InvestigationofSurfaceRoughnessDeterminationProblemsinAdditive ManufacturingTechnologies

1.MR. RAJKIRAN
2. Sumitha A,3. SuryaJetly T

Abstract.
In this paper, we delve into the surface roughness of components produced by additive manufacturing (AM) techniques, particularly in the context of the automotive industry. While conventional shaping methods like injection molding and extrusion have long been used, AM techniques are gaining prominence due to their numerous benefits, including swift and uncomplicated shaping, the capability to produce components with intricate geometries, manufacturability enhancements, and cost efficiency.For automotive components, adherence to stringent standards is crucial. The precision of processing and the quality of the surface play vital roles in determining the performance attributes of these parts. The surface roughness of 3D printed parts is influenced by various factors, including CAD to STL conversion, chosen printing method, layer thickness, printing speed, and temperature.Surface modification techniques can be employed to improve surface roughness, including the application of coatings and surface modification procedures such as chemical etching or physical methods like milling and turning. Additionally, software-based methods like ironing can also be utilized.It's important to consider the location of the investigation when evaluating surface roughness, whether it's horizontal or vertical walls, sloping surfaces, or areas affected by the staircase effect. Furthermore, the method of investigation, whether parallel or perpendicular to the layers and printing or infill direction, can impact surface roughness measurements.In this paper, we aim to explore these factors and their implications on surface roughness, with a focus on utilizing Sa as a metric for evaluating surface roughness, which extends beyond Ra (arithmetical mean height of a line) to provide a comprehensive understanding of surface characteristics.

Keywords: Ironing,SurfaceRoughness,AdditiveManufacturing

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308.TheIssuesofSurfaceRoughnessMeasurementinCaseofPlastic Vehicle Parts Produced by FFF Additive Manufacturing

1.MR. PRITHIVIRAJ

2. Sumitha A,3. Udhaya Harish B

Abstract.
In addition to traditional shaping technologies such as injection molding and extrusion, various additive manufacturing (AM) processes are gaining popularity due to their many advantages, including fast and simple shaping, the ability to create components with complex geometries, manufacturability improvements, and cost-effectiveness.In the automotive industry, parts must often meet strict requirements. The accuracy of processing and the quality of the surface are crucial indicators that determine the performance characteristics of these parts. The surface roughness of parts produced by 3D printing depends on factors such as the type of printer, chosen technology, material quality, and printing parameters.However, in many cases, the surface quality of parts produced by additive processing does not meet the required standards. As a result, various surface modification or treatment processes can be employed to improve surface quality, such as chemical etching, chipping, coating, plasma treatments, or unique structure creation methods like femtosecond laser treatment or ironing.There are several methods available for qualitative and quantitative characterization of surface quality, with surface roughness being one of the most frequently examined surface characteristics. The confocal surface roughness tester is commonly used for roughness measurement, providing fast results. However, it may have limitations when used on curved or very rough surfaces. Optical roughness testers, on the other hand, can determine both 2D and 3D surface roughness characteristics, making them suitable for measuring components produced by additive processing.This study focuses on surface roughness testing of PLA parts manufactured using FFF technology. It explores non-contact and contact roughness measurement methods from a technical perspective. The aim is to assess the advantages and disadvantages of each measurement technique and analyze the effect of the test method, such as measurement direction, by determining 2D and 3D roughness parameters.

Keywords:FFF,SurfaceRoughness,AdditiveManufacturing,Plastics

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309.ReviewofConnectedAutonomousVehiclesPlatooning:Technologies, Challenges, and Future Directions

1.MR. PRITHIVIRAJ

2. Udhaya Harish B,3. Sumitha A

Abstract: The introduction of Connected Autonomous Vehicles (CAVs) is bringing a significant transformation in the field of transportation, presenting unparalleled prospects for enhaisncing road safety, mitigating traffic congestion, and optimizing energy efficiency. Platooning, as one of the pioneering applications of Connected and Autonomous Vehicles, emerges as a very promising approach to enhance traffic flow and mitigate ecological consequences.This review examines the integration of advanced technology and themultifaceted obstacles associated with CAV platooning. Commencing with a comprehensive examination of the fundamental technologies involved, such as sensor fusion, vehicle-to-vehicle communication, and artificial intelligence algorithms, this article explores the essential elements that facilitate the smooth coordination of CAV platoons

Keywords: AutonomousVehicles, CAV platoons, sensor fusion, vehicle-to-vehicle communication

310.EvaluationofNewandTraditionalNumericalMethodsforLong-Term Simulations of Heat Transfer in Walls to Study the Effect of Different Shapes of Thermal Bridges

1.MR. PRITHIVIRAJ

2. Udhayanithi C,3. Uma Maheswari R

Abstract

In this study, we aim to address real-world engineering challenges related to heat transfer in building walls, particularly focusing on thermal bridges. Previous studies have identified the leapfrog-hopscotch and modified Dufort-Frankel techniques as the most effective and stable numerical methods for dealing with heat transfer problems in building walls. We employ these techniques to conduct transient and long-term simulations (spanning three months of the winter season) of 2D space systems to test their effectiveness.Our investigation specifically targets thermal bridges of different forms within multilayer walls of buildings, taking into account environmental factors specific to Hungary's climate, such as outside temperature and solar radiation. The goal is to enhance energy efficiency by understanding and mitigating heat loss through thermal bridging.To calculate steady-state heat loss, we utilize two recently published approaches that enable us to execute long-term simulations within relatively short running periods. Through these simulations, we analyze temperature distributions and total heat losses across various scenarios, including:

Keywords: Transient,HeatLoss,NumericalMethods,Long-Term,ThermalBridges

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311.Innovative Method for Producing Glass Foam Granules with Intact Surfaces

1.MR. PRITHIVIRAJ

2. Udhayanithi C,3. Stephen S

Abstract

This paper highlights the significance of glass foam as a versatile lightweight material in the construction industry, renowned for its exceptional properties such as mechanical strength, thermal insulation, and acoustic performance. While glass foam blocks have traditionally been used for insulation purposes, recent research has focused on leveraging glass foam granules to develop lightweight concrete formulations.However, the production of glass foam granules has posed a challenge due to the requirement for expensive equipment and rotary furnaces, limiting laboratory investigations and experimentation for researchers. In response to this challenge, this research introduces a novel method for the laboratory-scale production of glass foam granules. This innovative technique enables the creation of spherical glass foam granules with intact surfaces, offering a wide range of applications in lightweight concrete, insulation materials, building construction, and the glass foam industry at large.By presenting this new production method, the research opens up opportunities for innovative studies in the field of lightweight construction materials. It paves the way for further advancements in the utilization of glass foam granules and contributes to the ongoing evolution of sustainable and efficient construction practices.

Keywords: Concrete,Aggregate,FoamGlass,CellularGlass,Porosity,Lightweight

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312. GeometricModellingandFiniteElementAnalysisofaSprinkler

1. MR. PRITHIVIRAJ

2. Uma Maheswari R,3. Sumitha A

Abstract

This study focuses on the analysis of a water sprinkler system used for irrigation purposes. The sprinkler system operates by supplying pressurized water to the inlet port, which is then ejected into the air, forming water droplets that fall down to irrigate gardens or farms. The aim of the study is twofold: first, to perform geometric modeling of the sprinkler using CAD software, and second, to conduct flow analysis using Ansys software. In the geometric modeling phase, CAD software, specifically SolidWorks 2022, is utilized to design the sprinkler system. This involves creating a detailed digital representation of the sprinkler, including its various components and flow paths.Following the geometric modeling, flow analysis is performed using Ansys software. This analysis allows researchers to study how total pressure, static pressure, and water velocity change and vary within the sprinkler system under different conditions and modifications. By examining these flow properties, researchers can gain insights into the performance and efficiency of the sprinkler system and how it may be optimized for various irrigation scenarios.Overall, this study aims to enhance our understanding of the flow behavior within water sprinkler systems and provide valuable insights for improving their design and performance in agricultural and garden irrigation applications.

Keywords: TurboMachine,WaterSprinkler,PowerMachine, CAD

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313. Case-Study:MechanicalPropertiesofWeldedJointRegionsEffectson Structural Integrity Assessment

1.MR. PRITHIVIRAJ

2. Uma Maheswari R,3. Vanitha G

Abstract.

The traditional approach to construction design and structural integrity assessment typically involves numerical calculations performed on the construction elements without considering welded joints. While this approach is adequate for most constructions under normal loads, sudden overloading scenarios leading to structural collapse are often neglected. However, within the plastic deformation domain, differences in mechanical properties of welded joint regions can significantly impact structural integrity.To address this issue, a methodology employing inverse methodology is utilized to obtain mechanical properties of welded joint regions. This methodology involves tensile testing of a specimen containing welded joints while continuously measuring strain fields using stereocameras. The experimental results are processed using Digital Image Correlation, and a numerical computational model of the test specimen is created, incorporating the same parameters as the experiment.To improve the numerical model, deformations of all regions of the welded joint (base material, weld metal, and heat-affected zone) are imported into the model. Material properties of all three welded joint regions are obtained and then used in the analysis of welded joint influence on the structural integrity of various constructions, such as pipelines, pressure vessels, and bucket wheel excavators.Results from computational models show no difference between models without welded joints (traditional approach) and those with welded joints during elastic structural behavior. However, significant differences between the models emerge within the plastic deformation domain.As an extension of this research, plans are in place to conduct experiments on real constructions containing welded joints using the same inverse methodology. This will confirm the considerable influence of mechanical properties of welded joint regions on structural integriy and enable the formulation of a dependence coefficient between tensile testing specimens and real welded joint regions in actual constructions.

Keywords: StructuralIntegrityAssessment,WeldedJointRegions,PlasticDeformation

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314. AnalysisoftheEffectofInjectionMoldingTemperatureonMechanical Properties in the Case of PBT

1.MR. PRITHIVIRAJ

2. Vanitha G,3. Vidhya Bharathi K

Abstract.
The injection molding of technical plastics, such as polybutylene terephthalate (PBT), requires careful consideration of processing parameters to ensure optimal mechanical properties and minimize defects. Unlike materials like polypropylene (PP), technical plastics like PBT may react poorly to conventional processing conditions, such as extremely fast injection molding and cold tooling. Therefore, it's essential to modify processing parameters to achieve desired results.In this study, the effect of processing temperature on the mechanical properties of PBT is investigated. PBT is known for its sensitivity to stress concentrations, especially in areas with grooves and sharp corners, which can lead to reduced load-bearing capacity and susceptibility to cracking when stressed or impacted. Proper drying of PBT granules before processing is crucial to minimize moisture content and prevent defects.

Keywords:PBT,MechanicalTest,InjectionMoldingTemperature

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315. InvestigationoftheTribologicalPropertiesofAliphaticPolyketone

1. MR. PRITHIVIRAJ

2. Vignesh G,3. Yasar Arafath A

Abstract.
Tribology, a field of science focusing on the study of friction, wear, and lubrication between surfaces in relative motion, is becoming increasingly important in understanding machining processes. In machining, especially, the interaction between different surfaces under various conditions such as temperature and load plays a crucial role in determining tool wear and surface quality.In this study, the focus was on comparing the wear behavior of uncharged aliphatic polyketone, a high-performance technical plastic, with polyoxymethylene, known for its excellent wear resistance. Aliphatic polyketone, characterized by its unique alternating structure of ethylene, carbon monoxide, and propylene terpolymer system, holds promise for diverse applications.The research identified several factors influencing the formation of edge overlay during machining, including the material's brittleness, adhesion characteristics, abrasive wear, heat generation during chip formation, pressure on the tool, and thermal conductivity of the workpiece material.During the wear behavior study, specific parameters such as speed (1600 rpm) and torque (5.0 Nm) were employed. The results indicated that the polyketone material exhibited better wear resistance compared to polyoxymethylene. The gear produced from polyketone endured the test for 98 minutes before experiencing melt, while the polyoxymethylene specimen failed after 60 minutes, with tooth breakage and tip abrasion observed.These findings underscore the importance of material selection and understanding tribological properties in optimizing machining processes for enhanced performance and longevity of tools and components. Further research in this area can lead to advancements in material development and machining techniques, contributing to improved efficiency and reliability in various industrial applications.

Keywords: Polyketone,TribologyProperties,EngineeringPlastic,Polyoxymethilene

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316.AnalysisoftheEffectofInjectionMoldingTemperatureonMechanical Properties in the Case of PET(Polyethylentherephthelate)

1.MR. PRITHIVIRAJ

2. Vanitha G,3. Udhaya Harish B

Abstract.

In this study, we aimed to investigate the effect of injection molding temperature on the mechanical properties of polyethylene terephthalate (PET) with a 50% glass fiber filler. PET is a widely used polycondensation plastic known for its high stiffness, toughness, and dimensional stability, especially at elevated temperatures.Samples of the composite material were produced with injection molding temperatures set at 150°C and 180°C at the Institute of Energy, Ceramics, and Polymer Technology of the University of Miskolc. Standard specimens were then subjected to mechanical testing, including tensile strength tests, impact tests, and heat deflection temperature (HDT) tests to evaluate the material's deformation under load.The results of the mechanical tests revealed significant changes in the material properties based on the injection molding temperature. As the processing temperature increased, the tensile strength of the PET composite increased from 170 MPa to 230 MPa, with a corresponding increase in the E-modulus from 17770 MPa to 19511 MPa. However, the Charpy impact work decreased from 80 KJ/m2 to 65 KJ/m2 with increasing temperature.

Keywords: PET, Mechanical Test, Injection Molding Temperature, DHT Analysis, Impact Strength Test, Glass Fiber

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317.InvestigationoftheEffectofUVintheCaseofPLACompositesFilled with Natural Fillers

1.MR. PRITHIVIRAJ

2. Vignesh G,3. Vanitha G

Abstract.

In our households, we generate large amounts of waste, much of which consists of plastics. With the increasing importance of degradable (biodegradable) materials, I conducted an experiment to assess how certain household waste, combined with polylactic acid (PLA), affects the tensile strength, hardness, and impact toughness of the composite.For this experiment, I chose materials that are readily available in both industrial and natural settings. Considering outdoor applications, polymers are exposed to various weather conditions, including solar radiation, temperature fluctuations, wind, rain, humidity, air pollution, and erosive effects of dust and sand grains carried by the wind. Degradation of polymers can occur due to impurities or photochemical processes.I filled the test specimens with fillers of two different grain sizes (under 160 µm and over 160 µm), including coffee grounds, eggshells, potato peels, oak flour, and zeolite. The produced sponge-shaped test specimens were analyzed using Shore D hardness measurement. Subsequently, I exposed them to UV radiation in a chamber for one hour, simulating one year of outdoor UV conditions.After UV treatment, all samples showed increased hardness. The sample filled with 5% oak flour exhibited the most significant change, with hardness increasing from 77.50 to 87.20. Among the samples after UV treatment, the highest hardness was measured for the sawdust-filled sample, surpassing even the value of the pure polylactic acid sample. In this case, the hardness of the samples filled with oak flour increased by 12.51% after UV exposure, while the unfilled polylactic acid sample increased by 9.184%. On the other hand, the samples filled with 20% eggshell showed the smallest difference in hardness compared to before UV exposure, with only a 3.43% increase in measured value.These findings suggest that the addition of certain waste materials to PLA can enhance its mechanical properties, particularly its hardness, after exposure to UV radiation. Further research and experimentation could explore the potential of using waste materials as fillers in biodegradable composites for various applications.

Keywords: Biodegradable, Mechanical Test, PLA, NaturalFiller, ShoredHardnessMeasurement, UV Test

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318. DeterminingtheFluidizationCurveforZeoliteatDifferentMoisture Contents

1.DR. S. BOOBALAN

2. Yasar Arafath A,3. Subasri M

Abstract

During the fluidisation process, flowing air creates a movement of particles, which consequentlymakesalargermasstransfersurfaceavailablefor thedriedmaterial.Thebetterconta ct enables a larger amount of heat and material to be transferred to and from the inside of the particles than steady bed drying would do.The fluidization phenomenon is explained through a pressure drop diagram, often called the fluidisationcurve. Thefluidisationcurvecan bedividedintothreeparts,oneofwhichistheinterval of fluidisation. In this segment of the curve, there is a prolonged, linear section where the pressure drop remains constant. Various states of movement can be observed based on the materials' geometry, moisture content, adhesive behavior, and density. One such type of movement is bubbling, characterized by a turbulent, piston-like motion of particles.The experimental results are presented in two sets of diagrams, each set containing separate diagrams for different moisture content levels. The results from one diagram are summarized in Fig. 1, which demonstrates how moisture content influences both the minimum and maximum fluidization velocities, as well as the pressure drop created by the particles.

Keywords: Zeolite

319. OperationalSizingofaWetScrubber

1.DR. S. BOOBALAN

2. Santhosh Kumar P,3. Prasanna M

Abstract. The subject of our research is the investigation of an existing design of gas absorption scrubber and its operational sizing. The equipment would reduce the ethyl alcohol concentration of the gas leaving an absorber operating in an earlier stage. In devices with continuous phase contact, the correct phase contact is usually ensured by means of fillings, where the same concentration is always obtained at each location in the device, regardless of time. The purpose of the fillings is to provide and increase the contact area of the phases to improve the mass transfer. With the initial hypothesis that the mass transfer coefficient how depend on the type of filling, as a verification, the information table for fillings in the NITTETU handbook [1] was examined.

Afterfurthercalculations,thedatawereplottedbytypeofcharge,ring,saddleandgrid,asafunction of mass transfer coefficient and liquid mass flow rate. At low fluid mass flow rates, the values calculated for the saddle and the ring coincide, showing the expected result.

The plotted and calculated values are also presented together, using the equation for the discharge curve to calculate the mass transfer coefficient using the fluid volume flow rate. With this, we can calculate the needed parameters for the

Keywords: Wet Scrubber

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320.Mechanical and Architectural Regulations for Clean rooms with Proposed Solutions

1.DR. S. BOOBALAN

2. Sebasthiyan S,3. Uma Maheswari R

Abstract.
With the advancement of technology in various industries, the importance of cleanrooms is increasing across different sectors. Cleanrooms are crucial for controlling and minimizing the number of particles and impurities in the air space, while also considering factors such as local pressure conditions, temperature, and humidity. However, implementing such complex facilities requires the expertise and collaboration of specialists from multiple disciplines.One of the fundamental components of cleanrooms is the Heating, Ventilation, and Air Conditioning (HVAC) system. Specialized companies are tasked with designing and implementing these systems due to their complexity. The HVAC system enables control over air temperature, pressure, moisture content, and the frequency of complete air exchanges. In high cleanliness class cleanrooms, the air exchange rate can range from 6 to 540 exchanges per hour.To reduce the number and size of particles in the isolated space, various air filters must be installed in addition to the HVAC system. The selection of these filters begins with the mapping of different types and sizes of particles, followed by choosing the appropriate filter system accordingly. The objective of our work is to elucidate the definition of cleanrooms, relevant standards and regulations, as well as the planning steps and specific requirements of industries utilizing cleanroom environments.

Keywords:Cleanroom

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321. FormabilityandSurfaceQualityofMedicalGradeTitaniumin Incremental Sheet Forming

1. DR. S. BOOBALAN

2. Vanitha G,3. Manikandan M

Abstract:

The technique of Single Point Incremental Forming (SPIF) has gained considerable attention for its potential in shaping intricate geometries across a range of materials. This study focuses on investigating the influence of SPIF process parameters, specifically the step size and tool diameter, on the formability and surface roughness of medical-grade titanium sheets.The experimental setup involves testing three different step sizes (0.2 mm, 0.4 mm, and 0.6 mm) and three tool diameters (6 mm, 10 mm, and 14 mm). The primary objective is to assess the impact of these parameters on several critical aspects of SPIF, including thickness reduction, depth of fracture, surface roughness, and angle of formation within the fracture zone.Through a series of experiments, the relationship between step size, tool diameter, and these key performance metrics is thoroughly investigated. The results indicate that smaller step sizes lead to greater reductions in thickness and more precise formation angles within the fracture region. Additionally, it is observed that surface roughness decreases with an increase in step size and tool diameter.Understanding the intricate interactions between these parameters is essential for optimizing SPIF processes for shaping titanium sheets. This optimization insight has the potential to significantly enhance both production efficiency and quality in industries that rely on advanced forming methods.

Keywords:SPIF, Titanium, Step Size, Tool Diameter, Sheet Forming, Forming Parameters, Roughness

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322. Numerical Parametric Study on the Effect of EMS on the Segregation Behavior During the Solidification of Sn-10wt.%Pb

1 DR. S. BOOBALAN

2. Sathishkannan S,3. Sumitha A

Abstract.

The solidification process of alloys often results in macrosegregation, characterized by large-scale variations in solute element concentration, leading to non-uniform properties in the solidified metal. To address this issue and improve casting quality, various techniques, including the use of external fields, have been investigated.Stirring, whether direct or indirect, is recognized as an effective method to enhance columnar-to-equiaxed transition (CET) by promoting dendritic fragmentation. Among these methods, electromagnetic stirring (EMS) has shown significant promise in influencing the formation of metal grains during solidification. Research by Hachani et al. demonstrated that EMS can reduce the macrosegregation zone and facilitate the CET mechanism.Studies by Wang et al. supported the effectiveness of EMS, suggesting that modulation within a specific frequency range can transport rejected solute away from the solidification front. Building on these findings, our work focuses on a numerical parametric study to determine the critical frequency of modulation and identify the optimal time needed to mitigate or eliminate segregation issues during solidification. By precisely defining these parameters, we aim to improve the control and quality of the casting process.

Keywords: Solidification, Electromagnetic Stirring, Macrosegregation, Columnar-Equiaxed-Transition, Segregated

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323.PhaseChangeMaterialMeltingModelingUsingAnsysFluent

1.DR. S. BOOBALAN

2. Yasar Arafath A,3. Mohamed Aslam S

Abstract.

The increasing energy consumption of buildings has become a significant concern globally, with HVAC systems being the largest energy users. To address this issue, there has been a growing interest in thermal energy storage (TES) systems as a solution to reduce energy waste. TES systems offer the capability to store thermal energy for later use, thereby improving energy efficiency.There are several types of TES systems, including sensible heat storage, latent heat storage, and thermochemical energy storage. These systems can be integrated into various thermal conversion systems to maximize their effectiveness. Phase change materials (PCMs) are particularly well-suited for TES applications due to their high latent heat of fusion.By incorporating PCMs into building envelopes, thermal energy can be stored and released as needed, helping to regulate indoor temperatures and reduce the energy demand for heating and cooling. This approach can contribute to significant energy savings in both commercial and residential buildings, ultimately helping to mitigate the impact of building energy consumption on the environment.

Keywords:PhaseChangeMaterials,CFD,LatentHeatStorage.

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324.3DPrintingFailureDetection

1.DR. S. BOOBALAN

2. Sumitha A.3. Uma Maheswari R

Abstract.
This study explores the application of computer vision, specifically using the "YOLO by Ultralytics" software, to detect common failures in the Fused Deposition Modeling (FDM) 3D printing process. These failures include layer adhesion failure, bed adhesion failure, and print detachment, often referred to as "Spaghetti."To capture images during the printing process, the Raspberry Pi 4 and Raspberry Pi camera module 3 were utilized. The captured images were then processed using the YOLO neural network, which analyzes the images by dividing them into a grid and predicting bounding boxes and class probabilities for each grid cell. A consistent dataset was crucial for the success of the model, so the researchers created a private dataset considering various colors and lighting conditions.Preliminary results showed that the model was still in the learning phase, requiring further training and optimization. Despite this, the model successfully detected the extruder and two instances of "Spaghetti" with high confidence. This led to the termination of the printing process to prevent further waste of resources.Overall, this study demonstrates the potential of using computer vision techniques to monitor and detect failures in the 3D printing process, thereby improving efficiency and reducing material waste.

Keywords:3DPrinting;ImageProcessing;FailureDetection;FDM.

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325.SurfaceModificationwithIonstoImprovePropertiesofTools

1.DR. S. BOOBALAN

2. Lalitha K,3. Deepika P

Abstract

The study focuses on the importance of surface modification techniques to enhance the performance and longevity of tools, particularly in addressing tribological phenomena such as wear, corrosion, friction, galling, or sticking. Traditional surface properties of tools often lack sufficient wettability and adhesion, necessitating modification before application or further processing, such as coating with functional materials.Thin hard coatings deposited via physical vapor deposition (PVD), such as TiN and TiAlN, are commonly used to improve performance in various engineering applications. Ion implantation has also emerged as a promising surface treatment method to address wear and corrosion issues in metallic tools and components by enhancing their mechanical properties.With the growing importance of nanotechnology, there is a trend towards developing tools with nanomodifications to meet the demands of precision and ultra-precision machining. These modifications aim to achieve depths between 30-100 nm to address tribological challenges effectively.The study presents investigations into the possibilities of nanomodification using Kr ion implantation. Krypton ions are implanted into steel substrates using the mVINIS Ion Source, which is part of the TESLA Accelerator Installation (AIT), as depicted in Figure 1. This research aims to explore the effects of Kr ion implantation on surface properties and performance enhancement in tools, contributing to advancements in precision machining technology.

Keywords: Coating,IonImplantation,Kr,Nanomodification

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326.EfficiencyoftheMachiningProcessinWireEDMofHardMetals

1. DR. S. BOOBALAN

2. Dheetsika V.3. Jaisurya K

Abstract. The application of hard metals for parts with complex shapes, which are also subject to high quality requirements, brings a whole range of problems related to their production. In addition to the problems associated with the machining process itself, the economy of the applied machining process is also a problem. Due to the problems associated with the machinability of these high- strength materials, it is often impossible to use traditional production technologies for their production.However,formanyprogressivetechnologies,thesematerialssetalmostnolimitsinterms of machinability. However, in the case of their application. we often encounter problems related to the economy of the machining process itself, while the economic aspect is considered one of the essentialindicators inengineering.At thesametime,itisgenerallytruethattraditionaltechnologies often show more favourable economic efficiency results in relation to progressive machining technologies.Therefore,inpractice,itisoftennecessarytomakecertaincompromiseswhenchoosing the method of the machining process, especially for difficult-to-machine materials. For the reasons mentioned, an experimental research was carried out, the aim of which was to obtain relevant data regarding the quantification of qualitative indicators of the machined surface during the machining of hard metals by means of progressive electrical discharge machining technology. As part of the conducted experimental research, partial data of individual elements were obtained on the basis of which complex conclusions were drawn in mutual contexts. Subsequently, complex data regarding the effectiveness of the applied electrical discharge process in the machining of hard metals were summarized. During the conducted experimental research, it was found that due to the size of the machinedsurface,evenwithsuchademandingmachiningprocessaselectricaldischargemachining, favourable economic efficiency of the machining process can be achieved when machining hard-to- machine materials such as hard metals.

Keywords: Efficiency,HardMetals,Quality,ElectricalDischargeMachining

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327. PossibilitiesofPreventingRoundnessErrorsoftheMachinedSurface in WEDM

1.DR. S. BOOBALAN

2. Madhan S,3. Jaisurya K

Abstract.

The study focuses on addressing geometric inaccuracies that occur during electrical discharge machining (EDM) with a wire tool electrode, particularly the roundness deviation observed on both outer and inner machined surfaces of parts with round geometry. Despite achieving relatively high geometric accuracy, these inaccuracies are common in specific situations and can impact the quality of the machined parts.The experimental research aims to identify these deficiencies and determine their causes, followed by proposing solutions to prevent or minimize these shape errors. By conducting experimental measurements, the study seeks to understand the root causes of roundness deviation and develop strategies to mitigate them.Based on the findings from the experimental measurements, the study proposes specific technical solutions to eliminate or reduce shape deviations and improve geometric accuracy in machined surfaces. Additionally, the research aims to address inaccuracies in interpolation, which contribute to a range of geometric deviations in machined surfaces.Overall, the study aims to enhance the quality and productivity of production processes by addressing geometric inaccuracies in electrical discharge machining with a wire tool electrode, thereby meeting the demanding quality requirements of modern engineering practice.

Keywords: Machined Surface, Progressive Technology, Electrical Discharge Machining, Roundness Errors

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328. ProductionofEngineeredCellularStructures

1.MRS. S.VETRISELVI
2.Jaisurya K,3. Jenani R

Abstract.
The research aims to investigate the relationship between the material composition, cell size, arrangement, and wall thickness in cellular structures across various industries, including mechanical, aerospace, food production, pharmaceuticals, and construction. The focus is on understanding how these parameters influence the properties and performance of cellular materials.Overall, the research aims to provide insights into the design, optimization, and application of cellular structures across different industries, with a focus on enhancing performance, efficiency, and functionality in various engineering and pharmaceutical applications.

Keywords: Production,CellularStructure,BioInspired,Pharmaceutical.

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329.NovelApproachesofIndoorFlowAssessments

1.MRS. S.VETRISELVI
2.Kayathri S,3. Jenani R

Abstract.

provides a summary of a previously published review paper focusing on the utilization of computational fluid dynamics (CFD) to enhance ventilation system design in indoor environments. A comprehensive screening of publications from prominent publishers such as Elsevier, SAGE, and the Multidisciplinary Digital Publishing Institute over the past five years was conducted to identify key simulation approaches.Three primary types of simulations emerged from the literature review: "Natural Flow Type," which examines wind-induced ventilation patterns through buildings via wind tunnel assessments, "Dispersion Flow Type," which investigates particle dispersion in indoor spaces, and "Thermal Flow Type," which evaluates ventilation effectiveness by simulating buoyancy-influenced airflow patterns.Two main CFD simulation approaches are commonly employed for indoor flow assessment: steady or unsteady Reynolds-averaged Navier–Stokes (RANS or URANS) simulation and large-eddy simulation (LES). While RANS and URANS methods offer a balance between accuracy and computational efficiency, LES provides higher accuracy at the cost of significantly increased computational demand.The abstract also delves into the computational demands of LES, emphasizing the distinctions in discretization requirements between RANS and LES methods. Notably, LES involves the calculation of sub-grid scale eddy viscosity (vSGS) using various sub-grid scale models, with recommendations for cell size discussed in relation to different flow types.Further details and citations for the reviewed literature can be found in the referenced article [1]. This abstract sets the stage for presentations on recommendations for cell size in CFD simulations for indoor flow assessments.

Keywords: Simulation,Meshing,LES,CFD,Indoor Flow

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330. Li-IonBatteryCellBondingTechnologyDevelopment

1.MRS. S.VETRISELVI
2.Roshini B,3. Kayathri S

Abstract..

The research focuses on developing a bonding technology for joining Li-ion battery cells using electrically conductive adhesives with metallic content. While stand-alone cells are suitable for lower power devices, larger packs are required for higher power and capacity applications. Joining cells using electrically conductive adhesives offers advantages such as minimal thermal stress during bonding.Overall, the research aims to advance the development of bonding technologies for Li-ion battery cells, with a focus on improving adhesion strength, reducing electrical resistance, and ensuring long-term reliability of bonded joints in high-power battery packs.

Keywords: Laser,Steel,Li-ionBattery,ElectricallyConductiveAdhesive,SurfaceTreatment

331. Real-TimeFacialRecognitionBasedontheLocalBinaryPattern Histogram Algorithm

1. MRS. S.VETRISELVI
2. Monika Sri B,3. Stephen S

Abstract.

The study aimed to assess the accuracy of a facial recognition program based on the Local Binary Pattern Histogram (LBPH) method, particularly focusing on differences in accuracy between individuals of different age groups. Two participants were selected for the dataset: a teenage boy named Tan and a mature woman named Hanhan, with photos taken at various ages for the latterIn conclusion, the study highlighted the significant impact of age diversity within the dataset on the accuracy of facial recognition, particularly when using algorithms that rely heavily on facial features for analysis and comparison. Further research may be needed to explore methods for improving accuracy across diverse age groups in facial recognition systems.

Keywords: ComputerVision,FaceRecognition,OpenCV,MachineLearning,LBPHAlgorithm

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332. Numerical Modeling of Turbulence Flow Employing Vortex Generators and Comparing Various Corrugation Channel Types

1. MRS. S.VETRISELVI
2. Lalitha K,3. Angel Epsiba A

Abstract
The study investigates turbulent flow through different types of corrugated channels in a two-dimensional setting and compares the results. Corrugated channels are utilized in heat transfer enhancement techniques, but they can create vortices around the walls inside the channels, which reduces performance. The aim is to understand how different types of corrugations affect heat transfer and to explore methods for improving performance.The research involves a numerical investigation using computational fluid dynamics (CFD) techniques. The study focuses on comparing the Nusselt number, friction factor, and overall performance coefficient for various configurations of corrugated channels at different Reynolds numbers ranging from 5000 to 17500.The simulations are conducted using the ANSYS-Fluent commercial software, which is based on the finite volume method. The standard k-ε turbulence model is employed to model turbulence within the flow. This model allows for the calculation of turbulence kinetic energy (k) and its dissipation rate (ε), providing insights into the behavior of turbulent flows.The results of the simulations will provide valuable insights into the performance of different corrugated channel configurations in terms of heat transfer enhancement. By comparing the Nusselt number, friction factor, and overall performance coefficient, the study aims to identify the most effective design for enhancing heat transfer while minimizing pressure drop. These findings can inform the design and optimization of corrugated channels for various industrial applications where heat transfer is crucial.

Keywords:HeatTransfer,CorrugationsChannels,VortexGenerators,TurbulentFlow

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333. ColdSinteringofZincPowdersfortheManufacturingofPorousZinc *Materials*

1. MRS. S.VETRISELVI
2. Angel Epsiba A,3. Kavin J

Abstract.

The paper explores the application of cold sintering to zinc (Zn) powders and its potential implications for processing advanced porous materials. Cold sintering offers a low-temperature method for consolidating Zn powders, contrasting with conventional high-temperature sintering methods. This approach broadens the scope of applications for Zn-based materials while promoting environmental sustainability.Combining insights from materials science, chemistry, and engineering, the paper highlights the interdisciplinary nature of cold sintering and its practical significance. It emphasizes the prospects and challenges of adopting cold sintering as a sustainable and innovative method for fabricating advanced zinc-based materials.Fundamental principles of cold sintering are discussed, including the role of pressure, chemistry, and additives in achieving Zn compacts with a wide porosity range. The paper also examines the advantages and challenges associated with cold sintering of Zn powders, such as improved energy efficiency, compatibility with temperature-sensitive materials, and the potential for engineering novel composites.Successful sintering between Zn particles is achieved by adding approximately 10% of a sintering aid composed of a mixture of water, ethanol, and acetic acid. Applying pressure at 500 MPa for different durations results in high sintering degrees, even at room temperature. Increasing the temperature up to 250 °C further enhances compression strength, demonstrating the effectiveness of cold sintering for producing Zn-based materials with desired properties.

Keywords: Zinc,Cold/ChemicalSintering,PorousMetall

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334.SimulationofIndustrialProcessesUsingDigitalLeanTools

1. MRS. S.VETRISELVI
2. Uma Maheswari R,3. Subashini M

Abstract. In the rapidly evolving field of industrial process simulation, my project explores the innovative integration of the Godot game engine, Codesys for TCP/IP process control and Fischertechnik components to design an advanced industrial 3D environment. Godot stands out asa formidable open-source platform for 3D modelling and visualisation, while Codesys offers a comprehensive package for automation control and programming. Fischertechnik, known for its modular architecture, further enhances the versatility of this integration, drawing attention to its widespread application in educational and industrial scenarios. The core focus of this research is to conduct a comparative analysis between a newly developed simulation system based on Godot and the established Factory I/O software. The primary aim is to showcase the feasibility and advantages of integrating the proposed simulation system, as well as to evaluate its performance in comparison to Factory I/O. By underscoring the essential role of process simulation in contemporary engineering management, the paper aims to elucidate potential challenges, propose solutions, and ultimately underscore the potential benefits of this innovative approach. These benefits include cost efficiency, risk minimization, and continuous process improvement. Through this comparative analysis, the research seeks to provide valuable insights into the effectiveness and utility of the Godot-based simulation system in engineering applications.

Keywords: Godot Game Engine, Codesys, TCP/IP, Industrial Process Simulation, Fischertechnik, Engineering Management, Factory I/O

335.Innovations in Water Treatment

1.MRS. S.VETRISELVI
2.Kavin J,3. Gnanasamuel A

Abstract.
The widespread adoption of chlorine synthesis devices, such as HIPOGENP, has transformed water disinfection by producing active chlorine from common salt directly at the point of use. By employing electrolysis with table salt, water, and electricity, the HIPOGEN system ensures efficient and affordable water treatment in various settings, including individual households, urban and rural water systems, and industrial applications.Filtration and sorption are essential techniques in water purification, effectively removing impurities and microorganisms from the water. This process encompasses various technologies such as sedimentation, sand filtration, lime softening, and activated carbon filtration, which ensure the elimination of a wide array of impurities. Biological filtration facilitates the conversion of organic and inorganic matter, resulting in the production of clean water, carbon dioxide, and an increase in microorganism mass.Nitrification and denitrification are vital processes in the oxidation and reduction of ammonia, respectively, contributing to the removal of nitrogen compounds from water. Ion exchange processes aid in water softening and demineralization by eliminating undesirable dissolved substances through the exchange of ions between the solution and ionic mass.Nanofiltration and reverse osmosis utilize semipermeable membranes to effectively remove dissolved substances, making them valuable in water treatment and environmental protection within the chemical engineering sector.Additionally, dosing devices for the administration of liquid chlorine compounds, including amperometric monitoring of residual chlorine and measurement history, complete with remote control and monitoring, play a critical role in ensuring effective water treatment and disinfection.

Keywords:WaterTreatment,Filtration,Nitrification,Denitrification,Sorption

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336.SensitivityAnalysisinDynamicSystems:ExploringInsights

1. MRS. S.VETRISELVI
2. Dheetsika V,3. Gnanasamuel A

Abstract. Structuraldesignoptimizationfordynamicbehavioriscrucialforstructuresreliantont heir dynamic characteristics for operational performance and integrity. Key applications of this technology include integrated controls-structures design, flutter control, and buckling load modification, elaborated in a comprehensive review by Grandhi [1]. The dynamic response of a structural system is primarily governed by natural frequencies and mode shapes, where formal modification techniques are employed to manipulate these properties by adjusting design variables. These variables can vary depending on the type of modification problem, representing factors such as spacing, size, shape, and material composition in structural components like stiffened panels and cylinders. Sensitivity analysis is increasingly recognized as a valuable tool in structural reanalysis, providinginsightsintopotentialdesignchangestoachievedesiredstructuralproperties.While first- order design sensitivities are often used to predict the effects of proposed modifications, the use of second-ordersensitivitieswarrantscarefulconsideration,particularlyconcerningtheacceptabilityof first-order sensitivities for predictive analysis. Modal designsensitivities refer to derivatives of the eigensystem of a dynamic system with respect to variables available for modification,suchaschangesinsectiondiameter,length,or material composition (Figure 1). Shape sensitivity analysis isvaluableforunderstandingsystembehavior,optimizing systemresponses,andidentifyingshapesbasedonmeasure d system responses over time

Keywords: ModalDesignSensitivities,SensitivityAnalysis,StructuralDesignOptimization

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337.TheModern Approach to Optimizing Mechanical Systems

1.DR.P.J. JAYALAKSHMI

2. Abitha A,3. Albert S

Abstract. Themodernapproachtooptimizingmechanicalsystemsinvolvesemployingcutting-edgetechnologiesandmethodologiestoenhancetheperformance,efficiency,andsustainabilityofvarious mechanical processes and systems. This approach typically integrates advanced computational techniques, smart automation, and innovative materials to create more effective and eco-friendly solutions. Here are some key elements related to this topic: (a)AdvancedComputationalModeling:Utilizingsophisticatedcomputersimulationsandmodeling techniques to design and analyze mechanical systems, identifying potential weaknesses and opportunities for optimization. (b)Smart Automation and Robotics: Incorporating intelligent automation and robotics in mechanical systems to streamline operations, increase productivity, and reduce human error, thereby enhancing overall efficiency. (c)Sustainable Materials and Manufacturing: Implementing sustainable materials and manufacturing practices to reduce the environmental impact of mechanical systems, ensuring a more eco-friendly and energy-efficient approach to production. (d) Predictive Maintenance and Condition Monitoring: Implementing predictive maintenance strategies and condition monitoring technologies to prevent equipment failures and downtime, ensuring continuous operation and maximizing the lifespan of mechanical systems. (e) Integration of Internet of Things (IoT): Integrating IoT technologies to enablereal-time data monitoring, analysis, and management of mechanical systems, facilitating proactive decision- making and optimizing system performance. (f) Energy Efficiency and Renewable Energy Integration: Focusing on energy-efficient designs and incorporating

Keywords: Sustainability,Optimization,AdvancedComputationalModeling, SustainableMaterial

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338.Innovations in WastewaterTreatment

1.DR.P.J. JAYALAKSHMI

2. Arun AK,3. Abitha A

Abstract.Forefficientdesignandreliableoperationofthesystem,itisnecessarytocollectasmuch data as possible on the flow and composition of the wastewater in order to ensure compliance withallregulatoryrequirements.Adoptionofnewstandardsandregulations,alongwithpenaltiesfor non- compliance, encourages the use of devices and facilities for wastewater treatment to ensure safe discharge into the environment. Municipal wastewater requires complex purificationprocessestoremoveorganicandinorganicsubstances,includingsurfactantssuchassoa psanddetergents. Wastewater from metal processing industries, which include various chemicals, require complex purification processes, including chemical treatmenttoremovepollutants. Treated waters (effluents) can be discharged into natural watercourses, used for irrigation of energy crops, or injected underground, while sludge can be used as organic fertilizer,andbiogasforenergy production (Picture 1). In this paper,newtechniquesandevicesinthefeldofwastewatertreatement

Keywords: Wastewater,TreatmentBiogas

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339.DeterminationofFlashPointsofFlammableMixturesforExplosion Protection

1.DR.P.J. JAYALAKSHMI

2. Arun N,3. Balaguru J

Abstract.
The flash point is a critical parameter for assessing the explosion hazard areas of technologies involving combustible liquids. It indicates the temperature at which a flammable liquid's surface produces enough vapor to ignite under the influence of an ignition source. Regulations and standards worldwide use flash point data to determine fire hazard classes and assess the risk of explosive vapor under normal operating conditions.Two types of flash points are commonly considered: open-cup and closed-cup. Closed-cup flash points are preferred as they are easier to measure and typically yield lower values, resulting in a conservative approach to risk assessment. While many sources may simply list "flash point," it often refers to the closed-cup flash point.For homogeneous liquids, determining the flash point is straightforward and treated uniformly in literature. However, for heterogeneous mixtures containing combustible liquids and other substances like water, the flash point may differ significantly. Testing methods outlined in standards may not be readily available to everyone.This paper aims to establish a relationship between the flash point of mixtures using input parameters such as Antoine constants and vapor-liquid equilibrium data. By presenting flash point data for benzene, methanol, and xylene mixtures, it seeks to provide a method for estimating flash points using readily available resources. This information is crucial for ensuring safety compliance, as a flash point outside specified ranges may necessitate additional safety measures in explosion protection and environmental health and safety (EHS) practices.

Keywords: FlashPoint,FlammableMixtures,HazardousAreaClassification,ATEx

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340.StudyontheMechanicalPropertiesofNaturalRubberMixtures Plasticized with Selected Plant Oil

1.DR.P.J. JAYALAKSHMI

2. Dhinesh A,3. Dhivya A

Abstract

The study explores the potential of naturally available oils as alternatives to conventional plasticizers in rubber compounding, particularly in carbon black-filled natural rubber. These natural oils are considered more sustainable and environmentally friendly compared to traditional plasticizers, which may pose health risks and rely on non-renewable resources.Through various characterization techniques such as Dynamic Scanning Calorimetry (DSC), Scanning Electron Microscopy (SEM), Shore-A hardness tests, and UV aging, the research assesses the performance of rubber mixtures plasticized with plant oils or their derivatives. The results indicate that these natural oil-based plasticizers yield rubber mixtures with properties comparable to those plasticized with mineral oils commonly used in industrial applications. Moreover, the study suggests that only minor adjustments to formulation are necessary when transitioning from mineral oils to environmentally friendly natural oils.Specifically, plant oils such as pepper oil, palm oil, and coconut oil are highlighted as effective processing aids, offering similar performance to petroleum-based aromatic oils without the associated health risks, such as carcinogenicity.

Overall, the findings suggest that plant oils can serve as viable alternatives to conventional plasticizers in rubber compounding, offering comparable performance while reducing environmental impact and health risks. This research contributes to ongoing efforts to develop sustainable materials for industrial applications, particularly in the rubber industry.

Keywords:PlantOils,Petroleum-BasedPlasticizer,NaturalRubberComposites,Vulcanization

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341.CalculationAlgorithmofAirHumidificationforLaboratoryEquipment

1.DR.PJ. JAYALAKSHMI

2. Ebinesar Paul A,3.Dhivya A

Abstract.

Your work focuses on implementing a calculation algorithm to determine the amount of moisture input and heat output required to achieve specific air conditions (temperature and humidity) using different humidification methods in laboratory equipment.You mention the importance of maintaining appropriate air conditions, including temperature and humidity, in various environments such as comfort spaces, airplanes, and technological spaces like server rooms: In comfort spaces, maintaining relative humidity between 40-60% is crucial for occupant comfort, while in technological spaces, humidification helps prevent static charging and extends the service life of electronic equipment.Humidification in air handling units can be achieved through two main methods: introducing steam or atomizing water into small droplets. Steam humidification involves producing steam externally and feeding it directly into the airflow, while water atomization involves spraying water into the air stream, which cools the air through evaporation.Your work aims to develop a calculation algorithm that can determine the precise amount of moisture input and heat output needed to achieve desired air conditions using these humidification methods. This algorithm will provide valuable guidance for controlling laboratory equipment to maintain optimal air conditions, ensuring comfort and safety in various environments. Additionally, it contributes to the efficient use of resources by optimizing humidification processes.

Keywords:LaboratoryEquipment

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342.DevelopmentofBondingTechnologyforCompositeMaterialswithHigh Energy Density Surface Treatments

. 1.DR.P.J. JAYALAKSHMI

2. Ganesan M,3. Gayathri K

Abstract.

In the vehicle industry, there is a strong focus on continuous development to ensure that materials and technologies used for vehicle bodies meet the latest requirements. The primary goal is to reduce the self-weight of the manufactured vehicle while ensuring that material properties important for its intended use remain largely unchanged. Cost-effectiveness for the user, including vehicle consumption, and moderate environmental impact are crucial factors driving these developments. Environmental impact and cost-effectiveness must be considered throughout the vehicle's entire life cycle, from production through use to recycling.New materials and bonding technologies are emerging as important trends in vehicle production. However, the introduction of these modern materials and bonding methods also poses challenges because the bonding between body elements plays a crucial role in passenger safety, just as much as the properties of the materials used. Therefore, selecting the appropriate bonding technology for the chosen automotive materials is essential.Modern vehicles consist of tens of thousands of joints, where fasteners play a vital role in both component manufacturing and vehicle assembly. Each joint is a connection point where two parts are joined to function as a unit.Surface preparation is another critical aspect in vehicle manufacturing. Environmental effects or production and processing operations can lead to the deposition of various surface contaminants, which may hinder further processing or coating formation. Proper surface preparation, including cleaning, deoxidizing, and activating the surface, is essential before surface treatment procedures. The quality of surface preparation largely determines the properties of the coating formed during surface treatment processes, particularly for metal surfaces. Therefore, meticulous attention to surface preparation is crucial to ensure the desired performance and longevity of the vehicle components.

Keywords: SurfaceTreatment,Composite,Vehicle,Adhesives

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343. TensileStrengthInvestigationofPolyamide6.12ReinforcedbyGlass Fiber 30%

1.MR.K. DHANAPAL
2. Jeevitha R.3. Kaviya R

Abstract

Polyamide 6.12, commonly known as Nylon 6.12, is a versatile polymer used across various industries, including personal care products, automotive parts, and electric appliances. Initially developed to address the water absorption issue of Nylon 6, unmodified PA 6.12 has limited applications due to its weaker mechanical properties. However, by reinforcing it with materials like glass fiber (GF), its market potential and applicability can be significantly expanded.The addition of glass fiber reinforcement not only mitigates moisture absorption but also enhances mechanical strength, allowing for its use in new applications and production processes such as injection molding. By blending PA 6.12 with GF30%, we can capitalize on the benefits of both materials and cater to a broader range of industrial needs.To assess the mechanical properties of the PA 6.12/GF30% blend, a tensile test was conducted following ASTM D638 standards. The test was performed using an Instron tensile machine under room conditions (25°C and 50% relative humidity), with a strain rate of 20 mm per minute. The sample exhibited a fracture point after 18.6 seconds, with maximum strain (elastic and plastic deformation before breakage) recorded at 4.3%. The yield force for this sample was measured at 5295.7 units, indicating its strength and suitability for various industrial applications.

Keywords: Polyamide,Tensile,Reinforcement

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344. Digital Topological Concepts Applied to Medical ImageProcessing

1.MR.K. DHANAPAL
2. Kishorekumar M,3. Lavanya M

Abstract

This paper presents an automatic method relevant to medical image segmentation of magnetic resonance image with tumors, by means of a hybrid filter and connected component extraction. A center weighted hybrid max filter (CWHM) is used to remove the impulse noise from the medical image and the topological concepts are applied to extract connected components and edge detection.

Key words: Image segmentation, Topological space, Medical image, center weighted hybrid max filter.

345. Homotopy on Subspace Topology

1.MR.K. DHANAPAL
2. Loganathan P,3. Mohanasundaram K

Abstract

In this paper, the concept of subspace homotopy is been introduced among the continuous functions. The fundamental group on subspace homotopy is been established by defining an equivalence relation among the homotopy functions. Further, the concepts of digital subspace homotopy and digital subspace path homotopy have been introduced and some of their properties are discussed.

Keywords: Subspace Homotopy, Subspace Path Homotopy, Digital Subspace Homotopy, Digital SubspacePath, Digital Subspace Path Homotopy.

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346.A Study on M/M/C Queue Model under Monte Carlo simulation in Traffic Model

1.MR.K. DHANAPAL
2. Mukesh Kannan K,3. Lavanya M

Abstract

In this paper we present a stochastic queuing model for road traffic which captures the stationary density flow relationships. We have analysed the performance of controlling the homogeneous road traffic using Monte Carlosimulation with different service distributions. The future behaviour of road traffic network both in simulation and analytic methods have been analysed. Examples to illustrate these methods have been discussed.

Keywords: Inter arrival pattern, Service pattern, M/M/C Queue, Monte Carlo Simulation

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347.Comparative study on the Dyebility of cotton, silk and polyesterfabrics by conventional and electrochemical methods

1.MR.K. DHANAPAL
2. Nandha Kumar S,3. Nirmala M

Abstract

Cyclic Voltammetric experiments were carried out for the five different classes of dyes to understand the redox behavior (anodic oxidation / cathodic reduction). The redox property of dyes in relation to the dyeability was studied. The dyes selected were of anionic in nature. In the electrochemical method, the fabric was embedded onthe anode and potential was applied for coloration purpose. The dyeability results revealed that the depth of shade was independent of fabric substrate. The color strength (K/S) was measured by Computer color matching machine and the results were compared between the samples colored by both conventional and embedded systems. The uptake of dye on to the fabric increased with increase in applied potential.

Keywords: Cotton, Silk, Polyester, Dyeing, Conventional, Electrochemical

348.Generators in Intuitionistic Topological Spaces

1.MR.K. DHANAPAL
2. Pavithran P,3. Nirmala M

Abstract

The aim of this paper is to show that the possible number of intuitionistic sets for a nonempty set with 'n' elements. Also a new class of sets called intuitionistic generator and intuitionistic prime generator are defined and using it intuitionistic generator topology and intuitionistic prime generator topology are formed and their special properties are studied.

Key Words: Intuitionistic Generators, Intuitionistic Prime Generators.

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349.Non Destructive Flaw Detection by Laser Speckle Photography

1.MRS.S.POONGKODI

2. Prasanth R,3. Mukesh Kannan K

Abstract
Laser Speckle Photography, a non destructive optical method is presented to study the defect of a metal surface with the help of image processing technique. The speckle effect is due to the self-interference of coherent light source of He-Ne laser incident on an optically rough surface. This method is employed to identify the flaws by examining the induced strain concentration due to deformation. The fringe pattern is obtained and the defect canbe analyzed by Fast Fourier transform.

Key words: Non Destructive Testing, Laser speckle photography, Fast Fourier Transform.

350.Shelf-Life Study of Java Plum (Syzygium Cumini) by Laser Speckle B/D Pixel Counting Technique

1.MRS.S.POONGKODI

2. Mohanasundaram K,3. Kishorekumar M

Abstract
In this paper, shelf-life period of fruit Java Plum or Black Plum (its science name Syzygium Cumini) is assessed by biospeckle image analysis techniques. Laser biospeckle method is a non-destructive and non-invasive optical technique. This study was carried out through capturing the temporal history of the speckle pattern (THSP) by illuminating the surface of the fruit with a high coherent laser beam. The biological activity has been inferred from the changes of intensity fluctuations with respect to time. These changes have been measured from beginning to end by means of correlation functions. As a novelty, numerical analysis of the binary images with B/D pixel counting method reflects the state of investigated object.

Keywords: Biospeckle, Time History of Speckle Pattern, B/D pixel counting.

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351.Weakly Generalized Locally Closed Sets in Intuitionistic Fuzzy Topological Spaces

1.MRS.S.POONGKODI

2. Nirmala M,3. Jeevitha R

Abstract

In this paper, we introduce and study some new classes of weakly generalized locally closed sets and mappings in the context of intuitionistic fuzzy topological spaces.

Keywords: Intuitionistic fuzzy weakly generalized locally closed set, intuitionistic fuzzy weakly generalized locally continuous mappings, intuitionistic fuzzy weakly generalized locally irresolute mappings, intuitionistic

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352.A New Approach to Adaptive Neuro-Fuzzy Modelling Using Kernel Nonnegative Matrix Factorization (KNMF) Clustering For Weather Forecasting

1.MRS.S.POONGKODI

2. Nantha Kumar S,J, Kaviya R

Abstract

In meteorological applications, weather forecasting has remarkable importance in both scientific and technological challenges. The challenges exist due to its significance based on two main factors: 1) wide usage for several human activities and 2) several prospects created due to technological advancements in weather forecasting linked to applications such as computation evolution and the measurement systems. In order to forecast harsh weather conditions for enabling needed precautions, several mechanisms have been proposed for predicting and offering timely warning on hazardous weather phenomena. In the present work, various datamining methods have been proposed to improve the weather forecasting techniques. The weather forecasting being a well-known predictive challenge has been resolved primarily based on various model-based methods. There is a need for exploring new directions in weather forecasting weather owing to critical challenges related to collection of huge data related to space and time observations. In this work, enhancing prediction efficiency is specifically focused based on hybrid approach by combining discriminatively trained predictive models such as Genetic Algorithm (GA) along with Adaptive Neuro Fuzzy Inference System (ANFIS) for data modeling using a group of weather-related variables. As there is a scope for improving the proposed ANFIS-GA classifier using Kernel Non-negative Matrix Factorization (KNMF) method. The improvisation method follows spatial interpolation as the well-known long-range spatial dependencies and hence referred as Kernel Nonnegative ANFIS-GA (KNANFIS-GA) method.

Keywords: Genetic Algorithm (GA), Adaptive Neuro Fuzzy Inference System (ANFIS), Kernel Nonnegative Matrix Factorization (KNMF) and Fuzzy k-Nearest Neighbor Algorithm (FKNN).

353.physical properties of microwave-assisted ZnO nanostructures using wet chemical synthesis

1.MRS.S.POONGKODI

2. Loganathan P,3. Pavithran P

Abstract:
ZnO nanostructures were synthesized by wet chemical method using surfactant PEG6000 with two different molar concentrations (0.1M & 0.5M). The morphology of the ZnO crystals was investigated by ScanningElectron Microscopy (SEM) technique. The results indicate that the presence of surfactant significantly modify the shape and size of ZnO particles. In order to examine the possible changes in other properties of ZnO characterizations, FT-IR and UV-visible spectroscopy analysis were also studied and discussed.

Keywords: Zinc oxide, PEG6000, wet chemical synthesis, Surfactants.

354.A Study On Optimisation Of Master Health Checkup Process At A Multispeciality Hospital In Coimbatore

1.MRS.S.POONGKODI

2. Kaviya R,3. Nirmala M

Abstract
It has become a fact that any human being is prone to diseases irrespective of various factors. Long waiting hours during master health checkup makes the process more tedious and time consuming. This research study focuses on the master health check-up (MHC) department of a multispecialty hospital in Coimbatore with the objective of optimising the process using lean management techniques. A time study was conducted; the bottle necks in the process were identified and a current state Value stream map was developed. Also the future state VSM was developed explaining how the proposed suggestions like sequencing, modeling a patient tracking system and developing an online application for registration would improve the process by reducing waitingtime thereby improving the quality of service. A prototype of the android application was also developed during the period of study.

Key words: Value Stream Mapping (VSM), Master Health check-up (MHC), Sequencing, Waiting time.

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355. Evaluation of Supply Chain Performance for Packaged DairyProducts

1. DR.S.VINOTHKUMAR
2. Prasinth R,3. Prathiusha R

Abstract

Determining the supply chain length help companies to know how fast its products move from manufacturer to distributor, from distributor to retail outlets and from retail outlets to end-customer. Based on the literature review carried-out, it was found that many researchers have studied the supply chain performance using metrics at supply stage, manufacturing stage and distribution stage. Length of the supply chain of products is one of the important metrics to evaluate the supply chain performance. When it comes to perishable products, length of supply chain measured in terms of time indicates how fast the product moves and reaches the costumer hands from the time of manufacturing. No study has been attempted so far to measure the supply chain using time duration for perishable products. This paper focuses on measuring the supply chain length of products manufactured in one of the leading milk products manufacturing company located in Erode, an emerging city in south India. The sampling frame comprises the retailers those deals with dairy products in Erode district. A random sampling method is used by selecting 64 retailers. Retailers located in seven small cities in Erode district were considered for the study. Retailers taken for the study include those sell dairy and related products. 168 complete filled-in forms were collected directly in person from the owners of retailers. Five fast movingproducts were selected for the study that includes Panner, Lassi, Cheese, Curd and Ghee. Primary data were collected using a questionnaire. The length of the supply chain was arrived using the methodology based on time factors at the manufacturing stage, retailer stage and customer stage. Data on primary variables viz. Stock level, sales quantity, and date of manufacture were collected to determine the supply chain length. Test results on comparing the time taken for products across various locations, it was proved that there is a significant difference in the time taken to reach the customers between products at various locations. Supply chain performance is classified into the Rapid Responsive Supply Chain (RRSC) and Slow Responsive Supply Chain (SRSC) comparing the time difference between the estimated supply chain length and actual supply chain lengthof products.

Keywords: Supply Chain Length, Supply Chain Evaluation, Rapid Responsive Supply Chain, Packaged Dairy Products

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366. An Analysis On Reducing The Process Time In ManufacturingIndustries Through SMED

2. DR.S,VINOTHKUMAR
3. Rajendar S,3. Ramya S

Abstract

The aim of this study is to reduce the bottlenecks present in the machining process. A work order, though it is simple or complex takes multiple days to undergo processing. This time delay is mainly due to the idle time present at each stage of the process. The machining process has a number of sub processes like cutting, forging, CNC operation, VMC operation, deburring and packing. The objective of this study is to identify the time taken for each process and reduce the idle time. For this case, time, motion and method study has been made to identify and debug the bottleneck. The principles of SMED has been applied in order to enhance the study.

Keywords: SMED, Process reduction and CNC machining

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357.In Vitro Antioxidant Properties of Tabernaemontana Heyneana wall. Flowers

3. DR.S,VINOTHKUMAR
4. Rubin Bharathi B,3. Rubini P

Abstract

Antioxidants play a vital role in the prevention of various diseases. In this background, methanolic flower extract of *Tabernaemontana heyneana* was evaluated for the antioxidant properties. Significant metal ion (ferric, cupric and ceric) reducing power was observed in the methanolic extracts. Appreciable ferrous ion chelation (74.55% ± 4.62; IC50 = 589 µg/ml) and poor hydroxyl ion scavenging (28.53% ± 6.53; IC50 = 639 µg/ml) properties were recorded. Similarly, one way ANOVA results of ABTS and DPPH assays proved that there is no significant difference at 5% ($p > 0.05$) between the extracts and standard molecules, and the results were also supported by substantially recorded IC50 values. Hence, the flower extract of *T. heyneana* may be considered as a promising herbal medicine to cure a wide spectrum of diseases.

Key words: ABTS, antioxidant, DPPH, *Tabernaemontana heyneana*

358. Multiobjective Optimization Of Cucumber Juice With Lactobacillus Acidophilus Using Response Surface Methodology

1.DR.S,VINOTHKUMAR
2.Sakthivel T,3. Rubini P

Abstract

Probiotic juices are non-dairy products suitable for any common man to enjoy the promising value added health benefits and nutritional effects. The aim of this study was to develop a probiotic juice using inulin, stevia and *Lactobacillus acidophilus.* The are several factors which influence the probiotic juice like pH, titratable acidity ,salt, sugar and many more. A 3-factor, 3-level Box-Behnken design was used to optimize the chemical properties of probioticated cucumber juice. The independent variables selected were Inulin, stevia , and *L.acidophilus*from 1-4% respectively. The effect of pH, acidity, total sugars and reducing sugars reveal the cucumber can be probioticated with *L.acidophilus* along with its synergistic effect using inulin and stevia for its survival. So, with these results optimized, it can be concluded that the under utilised cucumber can be probioticated for any individual to obtain its health benefits.

Keywords: Response surface method, cucumber juice, *L.acidophilus,* inulin, stevi

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359. Central Composite Design Optimization Of Fluoride Removal By Spirogyra Biomass

1.DR.S.VINOTHKUMAR
2.Sandhiya S,3. Sangeetha S

Abstract

In this work, microwave assisted thermally activated adsorbent was prepared from Spirogyra biomass and the variable affecting adsorptive efficiency for fluoride removal were simultaneously optimized using the central composite design (CCD). The effects of variables viz. adsorbent dosage (0.1 – 1.0 g L^{-1}), sample pH (3 – 9), initial concentration (30 – 60 mg L^{-1}), and temperature (25 – 45°C) were optimized. The statistical parameters were calculated and the quadratic polynomial model with $R^2 = 0.9886$ and F value = 7168.95 was obtained. Further, the response surface diagrams were plotted accordingly . Non-linear optimization was carried out and under the defined optimum conditions the predicted fluoride removal efficiency with 95% confidence level was found to be 88.74±2.1%, which is in agreement with the experimentally arrived value of 87.96±2.3%.

Keywords: Adsorption; Optimization; Spirogyra; Response Surface Methodology; Fluoride

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360. Purification and Characterization of a New Organic Solvent Tolerant lipase from *Cladosporium Cladosporioides* sp. Strain nk-lf36

1. MS.B.JASMINE

2. Sangili andavan N,3. Santhoshalanraj A

Abstract

An extracellular lipase from *Cladosporium cladosporioides* was purified by ammonium sulphate precipitation followed by ion-exchange and gel filtration chromatography. The enzyme was purified 156.7 fold with 51.75% recovery after gel-filtration chromatography. Lipase with specific activity of 335.33 U/mg displayed a single band on both SDS-PAGE and native PAGE indicating purification to homogeneity. The molecular mass of the purified lipase was estimated to be 62 kDa. The optimum pH and temperature of the enzyme was 6.0 and 30°C respectively. The enzyme retained 85% of the activity at 40°C and pH 7.5 respectively. Ca^{2+} and Mg^{2+} ions stimulated lipase activity. The enzyme retained 105% activity in n-butanol and more than 80% of the activity in toluene and n-hexane. The enzyme was specific for the substrate *p*-nitrophenyl palmitate, showing a low K_m value of 0.82 mM and a V_{max} value of 12.5 mM min^{-1}. The lipase from NK-LB36 was thus characterized as mesophilic and solvent-tolerant suggesting that it can be a potential catalyst in biodiesel production.

Keywords: Cladosporium cladosporioides, Solvent tolerant lipase, Gel filtration chromatography, Ionexchange chromatography, SDS-PAGE

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361.Extraction of Dye from Ixora coccinea and Beta Vulgaris forEco-dyeing

1.MS.B.JASMINE
2. Saran L,3. Saratha C

Abstract
Dyeing is an important application in textiles because; it allows people to wear fabrics of different shades. Environmental issues of synthetic dyes led to gained customer interest in the natural dyeing sector again. In this article an effort has been made to use two plant sources as natural dye. Beta vulgaris commonly known as beetroot or sugar beet has several applications in food sector. Ixora coccinea is generally used as ornamental plant but it has been found to have several medicinal properties. In this study, extract from the flowers of Ixora coccinea and extract obtained from the peel of Beta vulgaris using methanol as solvent were analyzed for their phytochemical properties using TLC. The phytochemical compounds were identified as anthocyanins, phenolic acids in Ixora coccinea and carotenoids in Beta vulgaris. The extracts were then applied to treated, desized cotton fabric using various natural and chemical mordants. Based on analysis, the best mordant and technique for using mordant were determined for dyeing fabric. The fabric was subjected to dyeing and tested for its color fastness such as rubbing, washing and sunlight to know the best of all, with a view to natural dyeing of fabric and minimizing synthetic dyes, consequently to save environment.

Keywords: Ixora coccinea, Beta vulgaris, TLC, anthocyanins, phenolic acids, carotenoids, mordants, colorfastness.

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362.A Big Picture On Antimicrobial Strategies Then And Now

1.MS.B.JASMINE
2. Sharmila KV,3. Sheela rani N

Abstract

Antimicrobial resistance (AMR) pose a serious threat to the physicians as bacterial strains evolve to counteract the effects of medication. Staphylococcus aureus is one such bacterial strain that was well known for its resistance to methicillin - a narrow-spectrum β-lactam antibiotic of the penicillin class. Although Methicillin- resistant S. aureus (MRSA) is not always pathogenic but historically associated with Hospital Acquired Infections (HAI), respiratory infections such as sinusitis, and food poisoning. In the recent years, bacterial strains such as Pseudomonas aeruginosa, Escherichia coli, Enterococcus faecalis, Streptococcus pyogenes have also been identified and well-studied for their ability to counteract antimicrobials. On this note, this article provides a comprehensive understanding on the antimicrobial strategies adopted globally to overcome the threat of drug resistant bacterial strains.

Keywords: Bacterial strains, Antimicrobials, Antimicrobial strategies, Drug resistance, and Antibiotic

363.Glow discharge Plasma Treatment on Nonwoven Fabrics for Medical Application

1.MS.B.JASMINE
2. Sivaparamaleshwari B,3. Saratha C

Abstract

In this paper, glow discharge plasma operating in air atmosphere has been used to improve the surface hydrophilic and antibacterial properties of polyester non-woven fabric. The wicking height results show that the surface hydrophilic property of the fabric samples is greatly improved with plasma treatment. The analysis of SEM shows that the surface roughness of the treated fabric samples increases due to etching in plasma processing. The analyses of FTIR and XPS indicate that oxygen-containing and nitrogen-containing polar functional groups and addition that copper are embedded on polyester surface in plasma processing. Plasma- treated samples will use to good padding cloth and dressing cloth.

Keywords: Polyester non-woven fabric, Surface modification, Glow discharge, Hydrophilic property, Medical application

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364.Implementation Of Fuzzy Linear Programming Technique ForTraveling Salesman Problem

1.DR.T.SIVARAMAN
2. Sivaparamaleshwari B,3. Subash P

Abstract

This paper mainly deals with the Fuzzy Multi Objective Linear Programming model for symmetric Traveling Salesman. Fuzzy Multi-Objective Linear programming especially concerns with convertible target that are indicatory of optimality while inspecting all objectives concurrently with probable variance in objectives or limitations in ambiguous environment. The main objective of this work is to minimize the price, length covered, time, fuel price, vehicle maintenance price, traveling allowances during the traveling among the places by the Salesman. The proposed model for determining multiple objectives provides an appropriate result with acceptable tolerance level in ambiguous environment. The numerical computation is examined to demonstrate the procedure of appropriate solution.

Keywords: traveling salesman problem, symmetric tsp, fuzzy multi-objective linear programming, optimalroute

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365.The A-chromatic and b-chromatic number of Sun Graph, Barbellgraph and Some Named Graphs

1.DR.T.SIVARAMAN
2. Thulasimani M,3. Vasanth G

Abstract

In this paper, we discuss the structural properties of central graph of Sun graph and central graph of Barbell graph. Here we find out the achromatic and b-chromatic number of Sun graphs and Barbell graph. We apply the achromatic and b-chromatic colouring to these graphs. In addition to that, we find the achromatic and b-chromatic number of Central graph of some named graphs.

Keywords: achromatic number, b-chromatic number, Barbell Graph, Central Graph, Sun Graph

366.Investigations on Vickers microhardness and its related constantsof Single crystal: L-Histidinium semisuccinate (LHS)

1.DR.T.SIVARAMAN
2. Vasanthapriya S,3. Vigneswari G

Abstract

Single crystals of L-Histidinium semisuccinate were grown by slow cooling technique. Single crystal X-ray diffraction study confirms the formation of crystal structure. Vickers microhardness studies were carried out on the grown crystals of L-Histidinium semisuccinate over a load range of 10-500 g. It was found that the grown crystal exhibits normal indentation size effect as the hardness number decreases with increase in load. The Meyer's index number 'n' was found to be greater than 1.6, showing the grown crystal belongs to soft material category. The resistance pressure 'W' was calculated using Hays-Kendall approach. The values of fracture toughness (K_c) were determined from the measurements of crack lengths and the types of cracks were identified. Brittleness indexes (B_i) and yield strength (σy) were also assessed from the values of Vickers hardness number (Hv). The elastic stiffness coefficient (C11) values have been calculated using Wooster's empirical formula. The results were discussed in detail.

Keywords: Solution growth, Vickers hardness, Work hardening co-efficient, Elastic stiff

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367.Single Valued Neutrosophic Exponential Similarity Measure For Medical Diagnosis And Multi Attribute Decision Making

1. DR.T.SIVARAMAN
2. Vijayalakshmi M,3. Vijaya Sasthirirai K

Abstract

Neutrosophic set (NS) is very useful to express incomplete, uncertainly, and inconsistent information in a more general way. In the modern medical technologies, each element can be expressed as NS having different truth – membership, indeterminacy – membership, and falsity – membership degrees. Thus, the similarity measures for NS are important tool to deal with the decision making problems with neutrosophic informations. However, to overcome some drawbacks of existing similarity measures, this paper focus on introducing Single Valued Neutrosophic Exponential Similarity Measure (SVNESM) and weighted SVNESM. Then, we compare the proposed SVNESM with the similarity measures available in the literature and show their efficiency using some numerical examples for overcoming the drawbacks. Finally the similarity measure is applied for a medical diagnosis problem and Multi Attribute Decision Making (MADM) problem.

Keywords: Neutrosophic Set (NS), Single Valued Neutrosophic Set (SVNS), Similarity measure (SM), Single Valued Neutrosophic Exponential Similarity Measure (SVNESM), Medical Diagnosis, Multi Attribute DecisionMaking (MADM)

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368.Experimental and Theoretical Investigation on Corrosion Inhibition of Mild Steel in Sulphuric Acid by Coccinia indicaLeaves Extract

1.DR.T.SIVARAMAN
2. Sharmila KV,3. Vigneswari G

Abstract

Experimental and theoretical investigation on corrosion inhibition of mild steel (MS) in sulphuric acid by Coccinia indica (CI) leaves extract was studied using mass loss and quantum chemical calculation methods. The inhibition efficiency increased with increase in concentration of the extract but decreased with raise in temperature and increase in acid strength. Furthermore, the inhibition efficiency synergistically increased on the addition of halide ions. Thermodynamic parameter indicates the spontaneous adsorption of inhibitor on MS surface. The adsorption of CI on MS surface obeyed Langmuir adsorption isotherm. The individual compounds present in the CI extract were identified by GC-MS. FTIR and optical profiler images confirmed the adsorption of CI on MS surface. Quantum chemical studies confirmed that the MS is protected from corrosion by adsorption of the constituents in CI extract.

Keywords: Corrosion inhibitor, Steel, Surface roughness, Thermodynamics, Quantum mechanics

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369.Synergistic Effect of Gum Exudate on Substituted Piperidin-4-One in Corrosion Inhibition of Mild Steel in Acidic Medium

1.MR.S.KASIRAJAN
2. Sharmila KV,3. Sakthivel T

Abstract

Moringa oleifera gum exudate a non-toxic organic compound, is introduced as a synergist to 3,5-Dimethyl-2,6- diphenylpiperidin-4-one and the corrosion inhibition of mild steel in Hydrochloric acid medium is studied using weight loss method, potentiodynamic polarization and electrochemical impedance spectroscopy. Results show that 3,5-Dimethyl-2,6-diphenylpiperidin-4-one alone provided an average inhibition on the corrosion of mild steel and it was found that the inhibition efficiency increased synergistically in the presence of Moringa oleiferagum exudate. The inhibition efficiency increased with increase in concentration of the inhibitor but decreased with rise in temperature. Polarization studies reveal that the inhibitor system is of a mixed type. Impedance studies point out that a protective film is formed on the mild steel surface in the presence of the inhibitor.Fourier transform infrared spectroscopy and Scanning electron microscopy studies were used to investigate the nature of protective film formed on the mild steel surface.

Keywords: Corrosion inhibitor, Mild steel, Weight loss, Electrochemical impedance spectroscopy, FTIR, SEM,Surface morphology.

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370.Modified Cellulose with Tertiary Amine and Schiff Base Chelating Sites for The Removal Of Heavy Metal Ions fromAqueous Solution

1.MR.S.KASIRAJAN
2. Vasanth G, 3.Saran L

Abstract

Cellulose being the most abundant, renewable and natural green raw material has the potential application in adsorption of heavy metal ions. Among the various chelating groups in a cellulose matrix, the capacity of the – N (CH) 3 and –N=CH- chelating groups are higher and hence their binding capacity towards the metal ions are better. Cellulose bearing –N(CH3)2 and –N=CH– chelating groups (Cell-TA) was synthesized through two step chemical reaction process and its adsorbing efficiency towards the Pb(II), Cu(II) and Ni(II) metal ions from aqueous solution was evaluated. The structural characteristics and the metal ion adsorbing features are examinedthrough FT-IR, isotherm and kinetic models with thermodynamic studies.

Keywords: Cellulose, Schiff base, Spectral studies, Thermodynamics

371.Synthesis Characterization and Photophysical Investigation of Aggregated Electron Rich Zinc Phthalocyanine

1.MR.S.KASIRAJAN
2. Vasanthapriya S,3. Rubini P

Abstract

Zn-Phthalocyanine is well known for its chemical and thermal stability. In the present work we have synthesized a electron rich tetra carboxyl substituted Zn-Phthalocyanine derivative possess S atom. The synthesis is carried out by employing phthalimide as starting material. Final ZnPc derivative was synthesized by employing hexamethyl disilazane (HMDS) as the nitrogen source, which involves the cyclization of phthalonitriles co- ordinated by zinc metal ion. The synthesized molecules were characterized by IR, NMR and HR-MS spectroscopy techniques. Absorption, fluorescence and time-correlated single photon counting studies were carried out. Aggregation of ZnPc in DMF was revealed from absorption spectral studies. Singlet and triplet quantum yields were calculated. Further transient absorption studies were also carried out for triplet lifetime.

Keywords: ZnPc, TCTZnPc, aggregation, stacking, phthalonitrile, DMF

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372.Synthesis, Characterization and Antimicrobial Activity ofRuthenium (III) (E)-2-((6-Methylbenzo[D]Thiazol-2- Ylimino)Methyl)Phenol Complexes

1.MR.S.KASIRAJAN
2. Sheela rani N,3. Rubin Bharathi B

Abstract

Ruthenium(III) complexes of the type [RuX2(PPh3)(L)] (where X = Cl/Br; L = Benzothiazolyl-Salal Schiff base ligand) has been synthesized. The synthesized complexes were characterized by various physico-chemical and spectral techniques. An octahedral geometry has been tentatively proposed for all the complexes. The cytotoxic activity of the synthesized ruthenium(III) complexes has shown significant activity against a panel of microbes.

Keywords: Ruthenium(III) complexes · Schiff base · Benzothiazole · Bacteria · Fungi

373.A study on structural analysis of electroplated Nano crystalline nickel based thin films

1.MR.S.KASIRAJAN
2. Thulasimani M,3. Sharmila K.V

Abstract

The present work focuses on the synthesis and structural characterization of nickel based thin films like NiFeAg, NiMo, NiMoW and NiFeP through electrodeposition method. All these nickel based thin films were successfully coated on the copper substrate at constant current density of 10 A/dm^2 and 30 minutes time of deposition. The chemical composition of the synthesised thin films was analyzed by using Energy Dispersive X- ray Analysis (EDAX) spectrograph. The surface morphology of the electroplated films was investigated byusing Scanning Electron Microscope (SEM).The X-ray diffraction pattern of coated thin films reveals the crystalline nature, structure and size. The nickel based thin films already have numerous industrial applications which include Micro Electro Mechanical system (MEMS). The main aim of this current research work is to develop the new permalloy (Ni80% Fe20%) based thin films for fabrication of MEMS devices.

Keywords: Synthesis, electrodeposition, NiFeAg, thin films, crystalline and MEMS

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