7th NATIONAL CONFERENCE

on

Advancements in Engineering, Science and Technology

NCAEST'24

Organized By

ST. ANNE'S

COLLEGE OF ENGINEERING AND TECHNOLOGY

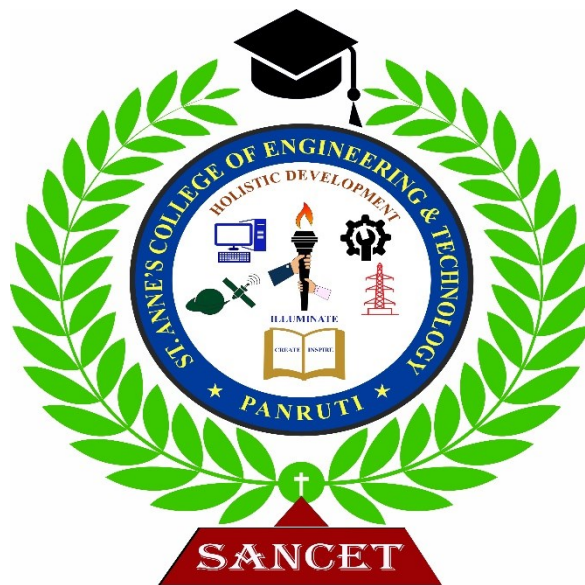## 02.05.2024

Proceedings of

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Science and Technology

NCAEST '24

02nd May 2024

Organised by

St. Anne's College of Engineering and Technology

Panruti, Cuddalore District – 607106.

Tamilnadu, India.

PREFACE

The 7th National Conference on Research and Development in Science, Engineering and Technology (NCAEST '24) was held on the campus of St. Anne's College of Engineering and Technology in Anguchettypalayam, Panruti of Cuddalore District on 2th May 2024.

Conferences pave way to bring together people with common interests and discuss issues and ideas related to various topics. Seventh National Conference on Advancements in Engineering, Science and Technology 2024 (NCAEST '24) will target state-of-the-art as well as emerging topics pertaining in the field of Science, Engineering and Technology and effective strategies for its implementation. It also provides a premier interdisciplinary platform for researchers, academicians, industry persons, practitioners, educators and students to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered, and solutions adopted in the fields of innovation. The objective of this National conference is to provide opportunity for the participants to interact and exchange ideas, experience and expertise in the current trend and strategies. Besides this, participants will also be enlightened about vast avenues, current and recent technological developments in various domain and its applications will be thoroughly explored and discussed.

The proceeding is a compilation of the 76 accepted papers and represent an interesting outcome of the conference. This year, NCAEST '24 has attracted Academicians and students across the country who have submitted their contributions with their latest advances. The accepted papers reflect the current trends in the following 5 broad research areas. 1) Computer Science, 2) Electrical 3) Electronics and Communications 4) Mechanical and 5) Engineering Science.

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MESSAGE FROM SECRETARY'S DESK

ST. ANNE'S COLLEGE
OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi. Affiliated to Anna University)
Anguchettypalayam -607 106 Panruti-Taluk, Cuddalore Dt.

Dr. Sr. T. Nirmala, SAT., M.Sc., B.Ed., Ph.D., D.HRD., D.PH.   Secretary, SANCET.

Dear delegates

Warm greetings!!!

On behalf of Congregation of Sisters of St. Anne, Tiruchirappalli (SAT) and St. Anne's College of Engineering and Technology (SANCET), I would like to cordially welcome you to the 7th National Conference on Advancements in Engineering, Science, and Technology (NCAEST'24). First and foremost, we are gratitude to our almighty Lord for his bountiful grace on this occasion and to you for participating in the conference at SANCET.

Engineering is one of the fundamental aspects of new inventions and innovations in the field of Computer Science, Electronics, Mechanical, Electrical, Artificial Intelligence etc. Engineering is the application of science to the optimum transformation of the resources of nature for the use of humankind. It will help and develop different aspects in the field of engineering and may lead to further research and technical practices on innovations which will ultimately benefit the society.

Our goal is to focus on recognizing current problems and future challenges and finding ways to overcome through insightful discussions and knowledge sharing and end in best possible solution.

Best wishes

27/4/24

Secretary,
St.Anne's College of Engineering & Technology,
ANGUCHETTYPALAYAM,
Siruvathur - Post, Panruti -TK
Cuddalore-Dist, -607 110.

MESSAGE FROM PRINCIPAL

Research endeavors across various engineering disciplines play a pivotal role in driving substantial advancements in the industrial sector. As stewards of education, institutions can foster research by creating conducive platforms for the scholarly community to engage, interact, and disseminate knowledge. In pursuit of this goal, the 7th National Conference on "Advancements in Engineering, Science, and Technology (NCAEST '24)" was convened on 2nd May, 2024, eliciting an enthusiastic response.

The conference was meticulously organized with the aim of uniting eminent academicians, scientists, researchers, scholars, and students. Its overarching mission was to facilitate the exchange and dissemination of knowledge, experiences, and research findings pertaining to the realms of innovation in science, engineering, and technology. Such initiatives not only bolster academic excellence but also facilitate the translation of research outcomes into tangible applications, thus propelling innovation and progress in the industrial arena.

I extend a heartfelt welcome to all esteemed conference delegates. On behalf of the entire SANCET team, I wish to express my sincere gratitude to the authors and participants for their unwavering support and cooperation. Special gratitude to the organizing committee for their tireless dedication in bringing this conference to fruition. It is my belief that all participants will

find this experience both enriching and rewarding.

Finally, I extend my heartfelt congratulations to the Heads of all departments, faculty, students, and all participants for their invaluable contributions to the organization and participation in this conference. I offer my sincerest best wishes for its astounding success.

Dr. R. Arokiadass, M.E., Ph.D.,

Principal

St. Anne's College of Engineering and Technology

MESSAGE FROM VICE-PRINCIPAL & DEAN

I am delighted in acknowledging the National Conference on Advancements in Engineering, Science and Technology 2024(NCAEST'24) organized by our institution. This conference stands as a beacon of collaboration and innovation, bringing together experts, researchers, and enthusiasts to share insights, explore new ideas, and address the pressing challenges of our time.

I welcome you all to St. Anne's College of Engineering and Technology and hope that this conference will act as a medium for all of us present here to ponder upon the topic of discussion, challenge us to strive towards it and inspire us at the same time

I extend my heartfelt appreciation to the Convener, the organizing committee, and volunteers for their tireless efforts in making this event possible.

Wishing you all a productive and enlightening experience.

Dr.Sr. Punitha Jilt, SAT

Vice Principal and Dean
St. Anne's College of Engineering and Technology

MESSAGE FROM DEAN OF EXCELLENCE

On behalf of the faculty, staff, and students of St. Anne's College of Engineering and Technology, I extend our warmest welcome to all participants attending the 7th National Conference on "Advancements in Engineering, Science, and Technology (NCAEST '24)", convened on May 2nd, 2024.

The conference endeavors to explore new and innovative synergies while fostering the dissemination of knowledge across various fields of Engineering, Science, and Technology. It serves as a platform to promote the development of high-quality research in engineering, focusing on modern technological and industrial advancements.

This forum offers participants the opportunity to network and engage in discussions surrounding the practical challenges and solutions within their respective domains. It serves as a unique space for the exchange of innovative ideas and technical expertise, driving forward technological advancements.

I hope, the conference promises to elevate to a new level of excellence, where technology and skill converge with opportunities and guidance. It stands as a milestone event, not to be missed, and I extend my best wishes for the resounding success of NCAEST '24.

Dr. Sr. S. Anita, SAT

Dean of Excellence and Head
Department of Electronics and Communication Engineering
St. Anne's College of Engineering and Technology

MESSAGE FROM CONVENER

The technology is developing at a rapid pace. In this era of globalization, the exchange of knowledge and skills has given a further development in the field of technology. Now it is high time to bring all academics, researchers, industry representatives and students together from various organizations from all over India to share and enhance knowledge on latest advancements in science, engineering and technology. This interdisciplinary conference provides finest opportunities to showcase their work and share their expertise.

I would like to express my thanks to all authors, members of the program committee, members of the organizing committee and the rest of the people involved in planning and developing of NCAEST '24 for their unconditional support, their great effort, and their valuable time. I would like to devote special thanks to the members of the program committee for providing excellent reviews of the submitted papers. I also wish to give special thanks to all the non-teaching members for their hard work and devotion, which made the conference a great success. All of them have made possible the successful accomplishment of NCAEST '24.

Special thanks to the authors, the committee members and the sponsors. I hope all the participants can obtain useful information from the proceedings.

Prof. K. Saravanan,

Department of Mechanical Engineering,
St. Anne's College of Engineering and Technology

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Department of Mechanical Engineering

A DEFENSIVE APPROACH TO RANSOMWARE WITH RANGAN AND HASH CONCEAL

Anbarasan.S[1,] Chandru.V[1,] Karthick.K[1]and Mr Manickavasagan. R[2]

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Abstract

Ransom ware is a type of malware that locks a victim's data or device and threatens to keep it locked—or worse—unless the victim pays a ransom to the attacker. Ransom ware often evades antivirus tools, encrypts files, and renders the target computer and its data unusable. The current approaches to detect such ransom ware include monitoring processes, system calls, and file activities on the target system and analysing the data collected. Monitoring multiple processes has a very high overhead; newer ransom ware may interfere with the monitoring and corrupt the collected data. To address this concern, this project adopted an open design approach to enhance the robustness of the proposed method. The proposed method detect ransom ware and protects critical files from existing ransom ware by applying a hiding strategy that poses a challenge to attackers in finding the target files. This project developed a proactive defence strategy against ransom ware threats, leveraging "RanGAN" for early detection and "Hash Conceal" for data protection. RanGAN (Ransom ware Generative Adversarial Network) employs advanced machine learning techniques to detect ransom ware behaviour patterns in

real-time, while Hash Conceal secures critical data from malicious encryption. Together, these technologies form a robust defence, ensuring rapid threat identification and minimizing data loss. This strategy aims to fortify cybersecurity against the evolving ransom ware landscape, providing a resilient shield for critical assets. This proactive approach not only bolsters an Organization resilience to ransom ware but also reduces the potential impact on critical data and operations. By leveraging RanGAN for early threat detection and Hash Conceal for data protection, organizations can enhance their cybersecurity posture and safeguard against the evolving ransom ware threat landscape.

AMLBOT: AN AI POWERED TRANSACTIONAL NETWORK AND BEHAVIOUR ANALYSIS TO DETECT AND PREVENT MONEY LAUNDERING ACTIVITIES

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Abstract

Money laundering is the process of disguising the proceeds of illegal activities as legitimate funds. Money laundering is a significant problem that poses serious threats to the integrity of the financial system, as it enables criminals to profit from illegal activities and finance further criminal endeavours. Money laundering is also linked to other crimes, such as drug trafficking, terrorism financing, and corruption. To combat money laundering, governments and financial institutions have implemented various measures, such as Know Your Customer (KYC) regulations, Anti-Money Laundering (AML) laws, and the use of financial intelligence units. The existing money laundering system is complex, involving multiple agencies and regulations. This complexity makes it difficult to detect and prevent money laundering activities. This project aims to prevent and detect money laundering activities by identifying suspicious transactions and monitoring the movement of funds through the financial system. In this project, we propose a transactional network and behaviour analysis system that utilizes Long Short-Term Memory (LSTM) to detect and prevent money laundering activities.

The proposed system uses historical financial data in a time-series format to train the LSTM network and identify patterns and trends that are associated with money laundering activities. By analysing the data in a time-series format, LSTM can identify unusual patterns of transactions and flag them for further investigation. The transactional network and behaviour analysis system can also predict future

trends in financial data, allowing for the detection and prevention of potential money laundering activities before they occur. The system provides a more efficient and accurate method for identifying potential money laundering activities, ultimately leading to a more effective and efficient anti-money laundering system.

AUTOMATIC CONVERSION 2D IMAGE TO 3D MODEL

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Abstract

Diffusion models have emerged as the best approach for the generative modelling of 2D images. Part of their success is due to the possibility of training them on millions if not billions of images with a stable learning objective. However, extending these models to 3D remains difficult for two reasons. First, finding a large quantity of 3D training data is much more complex than for 2D images. Second, while it is conceptually trivial to extend the models to operate on 3D rather than 2D grids, the associated cubic growth in memory and compute complexity makes this infeasible. We address the first challenge by introducing a new diffusion setup that can be trained, end-to-end, with only posed 2D images for supervision; and the second challenge by proposing an image formation model that decouples model memory from spatial memory. We evaluate our method on real-world data, using the Wavelet Transformation dataset which has not been used to train 3D generative models before. We show that our diffusion models are scalable, train robustly, and are competitive in terms of sample quality and fidelity to existing approaches for 3D generative modelling.

CERTIFICATE LOCKER USING TRUST - CENTRIC BLOCKCHAIN INTEGRATED CAPSULE SIAMESE NETWORK BASED DIGITAL CERTIFICATE STORAGE AND VERIFICATION SYSTEM

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Abstract

Millions of students complete their education each year and go on to do higher studies or a corporate job. In this case student credentials are verified through a lengthy document verification process. This results in significant overhead as documents are transferred between institutions for verification. It is a costly, lengthy, and time-consuming procedure as university authorities invest millions of dollars in maintaining the entire process each year. The employer also takes plenty of time to verify the authenticity of the applicant's and applicant's certificate. People frequently lie about their degrees and qualifications by counterfeiting certificates. A fake certificate generated by skilful scammers is always tough to identify and address as the original one. Therefore, there is a crucial need to upgrade the certification and verification process. Block chain has recently emerged as a potential alternative to manual student verification process. This project introduced a Block chain-based decentralized Student Verification platform that offers an easy way to issue, check, and verify educational certificates. The student's identity and document are both verified by matching the hashes already present in the Block chain. Also, in the proposed method the documents are linked to the student to add another layer of verification. The implementation

of this proposed platform can be used to issue, receive and verify the student and their certificates. This system will help students as well as institutions to maintain security and transparency at the same time.

DETECTION OF PHISHING WEBSITES USING MACHINE LEARNING

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Abstract

Phishing is a widespread tactic used to trick gullible people into disclosing their personal information by using bogus websites. Phishing website URLs are designed to steal personal data, including user names, passwords, and online financial activities. Phishers employ websites that resemble those genuine websites both aesthetically and linguistically. Utilizing anti-phishing methods to identify phishing is necessary to stop the rapid advancement of phishing techniques as a result of advancing technology. A strong tool for thwarting phishing assaults is machine learning. Attackers frequently use phishing because it is simpler to fool a victim into clicking a malicious link that looks authentic than to try to get past a computer's security measures. The malicious links within the message body are intended to appear to go to the spoofed company utilising that company's logos and other genuine information. In the method that is being presented, machine learning is used to create a revolutionary approach for detecting phishing websites. Gradient Boosting Classifier is the model we utilised in our suggested strategy to identify phishing websites based on aspects of URL significance. By extracting and comparing different characteristics between legitimate and phishing URLs, the suggested method uses gradient boosting classifier to identify phishing URLs. The studies' findings demonstrate that the suggested approach successfully identifies legitimate websites from bogus ones in real time.

FAKE PRODUCT REVIEW MONITORING AND REMOVAL FOR GENUINE ONLINE PRODUCT REVIEW USING IP ADDRESS TRACKING

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Abstract

In general public require reviews approximately about the product before investing their money onto it. So the users look for various opinions within the internet site however they can't differentiate between genuine or fake reviews. In few websites some of the good reviews are posted by the company members in order to create a false product reviews. Also they used to provide good reviews for the different products designed by their own company. The user will no longer be capable on finding out whether an evaluation is authentic or faux. To discover the fake evaluation in the websites this "Fake Product Review Monitoring and Removal for Genuine Online Product Reviews Using IP Address Tracking" application is delivered. This system will discover fake evaluations made via posting faux feedback approximately a product with the aid of figuring out the IP address along with review posting patterns. The user will be login to the application with the usage of his consumer identification and the password and will be viewing various products and will provide the review about those product. To discover whether an overview is faux or proper, system will be finding out the IP address of a consumer. If a system study faux reviews sent by using the similar IP Address then it will be marked as fake review which will be discarded by the admin from the system. This system allows a consumer to find out the correct assessment of a product.

GAURDIAN VAULT BUILDING A SECURE BACKUP   SOFTWARE

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Abstract

Guardian Vault is a secure backup software system designed to protect sensitive data such as API keys, secrets, wallets, and private keys from unauthorized access and data breaches. Traditional storage methods, such as plain text in environment files or databases, are no longer sufficient to ensure data security. Guardian Vault encrypts data and enforces access control policies to safeguard sensitive information, ensuring its confidentiality and integrity. The project utilizes a component-based architecture, with the React JavaScript library serving as the foundation for building user interfaces. Reacts declarative and component-based approach simplifies UI development, making it easier to manage and maintain code. The system also leverages a virtual DOM to improve performance, reducing the number of DOM manipulations needed to update the UI. Guardian Vault supports both cloud-based and on premise deployments, providing flexibility for different deployment scenarios. It seamlessly integrates with popular cloud infrastructures and native technologies such as Harshi Corp Vault, allowing organizations to leverage their existing investments in security tools. The system and User-friendly interface and robust security features make it an ideal solution for organizations seeking to enhance the security of their sensitive data. Guardian Vault offers a secure, encrypted storage solution for organizations looking to protect their sensitive data from unauthorized access and data breaches. With its comprehensive security features and flexible deployment options, Guardian Vault is a valuable asset in today & data-driven world.

HETEROGENEOUS SOCIAL NETWORKS DIGITAL IMAGE PRIVACY PROTECTION SYSTEM USING DEEP TRANSFER LEARNING AND BLOCK CHAIN

Roshan Willson. V[1], Muhammad Anas.S[1], Rajkumar.K[1] and Mrs. Gayathri.T[2]

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Abstract

Today, people frequently interact with their families, friends, and colleagues through online social networks (OSN), especially with the advent of smart phones with high-quality camera embedded which enables users to record their life anytime and anywhere. People enjoy posting and sharing their photos in online communities, blogs, and content sharing sites. Typically, social networks assume default public access for all information posted by a user, unless the user specifically restricts such access via a set of complicated privacy settings, making unaware users vulnerable and their privacy exposed. Therefore, it is a challenge to ensure the security of sensitive data while providing efficient and privacy-preserving social network services for users. In this project, we propose Photo Privacy System, a block chain-based secure photo sharing framework that provides powerful dissemination control for Heterogeneous-social network photo sharing.

IMAGE VACCINATOR AN IMAGE TAMPER RESILIENT USING INVERTIBLE NEURAL NETWORK

Natarajan.P[1], Udhayamoothy.R[1], JefferyParsannaRaj.J[1] andMs. Gayathri.T[2]

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Abstract

Digital images are susceptible to a range of vulnerabilities and threats that can compromise security and privacy in online social networking sites. Image tampering attacks involve the unauthorized or deceptive alteration of digital images, often for the purpose of misrepresenting their content or context.Once the images are manipulated, it is hard for current techniques to reproduce the original contents.To address these challenges and combat image tampering, research on image tamper localization has garnered extensive attention. Image Processing and Machine Learning techniques have bolstered image forgery detection, primarily focusing on noise-level manipulation detection. Furthermore, these techniques are often less effective on compressed or low-resolution images and lack self-recovery capabilities, making it challenging to reproduce original content once images have been manipulated.In this context, this project introduces an enhanced scheme known as Image Immunizer for image tampering resistance and lossless auto – recovery using Vaccinator and Invertible Neural Network a Deep Leaning Approach. Multitask learning is used to train the network, encompassing four key modules: apply vaccine to the uploaded image, ensuring consistency between the immunized and original images, classifying tampered pixels, and encouraging

image self-recovery to closely resemble the original image. During the forward pass, both the original image and its corresponding edge map undergo transformation, resulting in the creation of an immunized version.Upon receiving an attacked image, a localizer identifies tampered areas by predicting a tamper mask. In the backward pass with Run-Length Encoding, hidden perturbations are transformed into information, facilitating the recovery of the original, lossless image and its edge map, ensuring image integrity and authenticity.This proposed technique achieves promising results in real-world tests where experiments show accurate tamper localization as well as high-fidelity content recovery.

JUDICIAL EVIDENCE INTEGRITY AND SECURITY SYSTEM FOR PROOF OF FAIR JUDGEMENT LAUNDERING ACTIVITIES

Chandhiya. S[1], Leelavathi. P[1], Sivaranjani. L[1] and Mrs. Nivetha.P[2]

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Abstract

Digital evidence is defined as information and data of value to an investigation that is stored on, an electronic device. In criminal investigations, civil lawsuits, and regulatory compliance, digital evidence such as multimedia documents, and transaction records forms the basis for decision-making. However, factors like data alteration, unauthorised access, or flaws in centralised storage can threaten the security and integrity of digital evidence. Therefore, a secure storage model is needed to improve the investigation process and safeguard any sensitive information collected. To address the lack of an automated mechanism for secured the evidence and maintaining integrity, a model was developed targeting the various security and forensic aspects during the investigation lifecycle. An efficient forensics architecture is proposed that establishes the Chain of Custody (CoC) in block-chain technology, where participating stakeholders create a private network to exchange and agree on different investigation activities before being stored on the block-chain ledger. Detecting tampering in various types of files using Artificial Intelligence algorithms are Image with CNN, Word Document Embedding's using BERT, Video Frame-level Analysis with TCN, Audio Spectrogram Analysis with

HMM, PDF Document Structure Analysis. Utilizing fuzzy hash functions enables forensic investigators to successfully deal with permissible alteration of digital evidence by standardizing the forensics processes, DB-CoC architecture enforcing a standard approach and improves the quality of the finished result. The proposed architectural solution delivers robust information integrity, prevention, and protected mechanism to permanently and immutably store the evidence (chain of custody) in a private permissioned encrypted block-chain ledger. The proposed DB-CoC architecture provides complete data provenance, traceability, and assurance for performing different operations as well as trust between the chain of custody events while collecting, storing, analysing, and showing the digital evidence.

ONLINE FAKE LOGO DETECTION SYSTEM

Bhagyasri.S [1], Jeeva.A[1], Jayasri.B[1] and Nivetha.P[2]

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Abstract

With the increasing prevalence of online fraud and the use of fake logos to deceive consumers, there is a need for effective methods to detect and prevent the use of fake logos on the internet. In this paper, we propose a method for detecting fake logos using machine learning techniques. Our approach involves extracting features from the logos and training a classifier to distinguish between real and fake logos. We evaluate the performance of our method on a dataset of real and fake logos and demonstrate its effectiveness in detecting fake logos with high accuracy. Every day, hundreds of domain names, websites and logos are being cloned by cyber criminals who want to gain your trust so they can steal your data. It is becoming a big issue in the online world and needs to be addressed. This article will discuss the initial project background of our new Online Fake Logo detection system. Every day, hundreds of domain names, websites, and logos are being cloned by cyber criminals who want to gain our trust to steal our data. As a result, faking logos is becoming a big issue in the online world and needs to be addressed. As a result, fake logos on the internet have become a significant source of worry for businesses and consumers. The algorithm can detect differences in logo design, color, and positioning and assess the possibility of a fake logo. The system's

accuracy was evaluated on a massive dataset of actual and false logos, and it obtained a high level of accuracy in recognizing fake logos. The fake logo identification technology has the potential to dramatically increase the credibility and dependability of online material, thereby protecting brand identity integrity. This research proposes a method for detecting fake logos using a Context-dependent similarity algorithm. Our approach involves extracting features from the logos and training a machine-learning classifier to distinguish between real and fake logos. We evaluate the performance of our method on a dataset of real and fake logos and demonstrate its effectiveness in detecting fake logos with high accuracy.

SENSORY DETECTOR OF HAZARDOUS GASES INPOULTRY FARM

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Abstract

The poultry farming industry faces significant challenges in maintaining optimal environmental conditions for both the welfare of the poultry and the health of farm workers. Among these challenges, the monitoring and detection of hazardous gases such as ammonia, carbon dioxide, and hydrogen sulphide are of utmost importance due to their potential adverse effects on both animal and human health. In this project, we propose the development of a sensory detector for hazardous gases in poultry farms using AI and Google Colab. The project aims to leverage AI algorithms to enable real-time monitoring and detection of hazardous gases in poultry farm environments. Through the integration of advanced gas sensors with machine learning models, the sensory detector will be capable of accurately identifying and quantifying hazardous gas concentrations, thereby facilitating timely interventions to mitigate health risks. The main project content encompasses several key components, including a comprehensive literature review of existing methods and technologies for gas monitoring in agricultural settings, the design and implementation of the sensory detector using Google Colab and AI frameworks such as Sensor Flow, and rigorous testing and evaluation of the detector's effectiveness in simulated poultry farm environments. The effectiveness

of the developed sensory detector will be assessed based on criteria such as accuracy, reliability, sensitivity, and specificity in detecting hazardous gases. Furthermore, considerations for scalability, ease of deployment, and integration with existing farm management systems will be addressed to ensure practical utility and widespread adoption of the detector in real-world poultry farming operations. Through this project, we aim to contribute to the advancement of agricultural technology by providing poultry farmers with a robust and user-friendly tool for gas monitoring, thereby enhancing animal welfare, protecting human health, and promoting sustainable farming practices.

SIGN UP WALLET: A BLOCK CHAIN BASED PERSONALLY IDENTIFIABLE INFORMATION (PII) MASKING USING LOOKUP SUBSTITUTION

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Abstract

Digital identity is a user's online identification, similar to a physical identification card such as a passport or driver's license. A digital identity contains characteristics or attributes of the user. As we access apps and websites, organizations are dominantly using centralized and federated identity management systems (e.g. signing in with a Google or Facebook account) by default. The centralized system puts data at risk of large scale hacks and breaches while the federated model enables companies to track user data without their knowledge. Existing identity management systems either use a centralized authentication server or rely on identity providers to authenticate users for gaining access to various services. These systems have failed to safeguard user data privacy and do not encourage the portability of identity data. A trustworthy and reliable system is needed so that individuals can interact and network digitally and securely. These problems are motivated the development of the Sign Up Wallet a block chain and machine learning based Self-Sovereign Identity model to manage digital identities. In this proposed system users store their digital identity in a Sign up Wallet with cryptographic keys. When registering with a trusted service provider, a Unique

Personal Identifier (UPI) Code is submitted for direct credential verification. Logistic Regression is used for predicting whether a website is trusted or not. If the service provider is untrusted, a masked credential is generated using a Lookup Substitution Algorithm, preserving privacy during verification. This masked credential is then provided to the service provider, allowing verification without exposing the raw data and maintaining user security.

VIRTUALHR: AI-DRIVEN AUTOMATION FOR EFFICIENT AND UNBIASED CANDIDATE RECRUITMENT IN SOFTWARE ENGINEERING ROLES

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Abstract

Recruitment is an integral part of any HR professional's role and critical for helping an organisation build a thriving workforce ready to support business growth. The entire recruitment process is sometimes relatively complex, especially if an HR professional is hiring for multiple roles at once. It's common for HR professionals to face several challenges during the hiring process. To overcome this challenge this project is to develop an AI-driven recruiting platform that aims to make the hiring process more efficient and unbiased. By leveraging artificial intelligence and machine learning, Virtual HR automates various aspects of the recruitment process, such as candidate sourcing, screening, and engagement. The proposed framework employs an automatic resume analysis system tailored to match candidate profiles with suitable job postings, providing valuable recommendations to employers using content based filtering. The subsequent automated virtual interview process involves three distinct stages: an aptitude test, a programming skill test, and a video calling interview facilitated by Virtual HR. It uses natural language processing (NLP) to understand, interpret, and respond to user voice inputs in a conversational manner and Attention Mechanism for

behavioural prediction during visual interview. The proposed system Allows candidates to encounter common interview questions and quantifies how they share their attention (gaze and head rotations) to engage with multiple interviewers based on their conversational role (speaking or listening). The results of these analyses are then provided to HR, who utilizes the insights to make informed and data-driven decisions during the final selection process. The integration of advanced technologies not only expedites the recruitment workflow but also introduces a modern, data-driven dimension to candidate evaluation. The proposed work is focused on software engineering job search and resume upgrade.

A CYBERIZATION SYSTEM FOR BITCOIN MONEY PROBE

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Abstract

In recent decades, there has been a burgeoning interest among economists, policymakers, academics, and market practitioners in predicting market trends. This interest stems from the potential to leverage insights derived from data analysis to make informed decisions in the volatile world of stock trading. The proposed project aims to contribute to this field by studying and refining supervised learning algorithms for predicting stock prices. Utilizing data mining techniques, the project will analyse historical stock data, considering various factors that influence stock value. By incorporating these factors into deep learning algorithms, the project seeks to identify patterns and trends that can aid in forecasting future stock prices. Specifically, convolutional neural networks (CNNs) and recurrent neural networks (RNNs) will be employed to discern complex relationships within the data. The ultimate goal is to develop a robust framework capable of accurately predicting stock prices based on past performance and relevant market indicators. Such a tool would not only be valuable for seasoned investors seeking to optimize their trading strategies but also for newcomers looking to enter the stock market with greater confidence. By harnessing the power of advanced deep learning algorithms, this

project endeavors to enhance our understanding of stock market dynamics and provide actionable insights for investors navigating the complexities of financial markets.

AI BASED SURVEILLANCE SYSTEM USING
FACE RECOGNITIONS BASED ON ENSEMBLE LEARNING

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Abstract

In many of the educational institutions, managing attendance of students/candidates is tedious, as there would be large number of students in the class and keeping track of all is onerous. There are situations where student act as proxies for their friends even though they are not present. The presence of students repeatedly skipping classes and spending considerable time wandering on campus signals potential underlying issues, such as disengagement, personal challenges, or dissatisfaction with the educational experience. Traditional methods of monitoring attendance are often inadequate in addressing these nuanced challenges. Therefore, there is a need for an AI-based College Surveillance System using Faster R-CNN to accurately detect class skippers and provide insights into their behavioural patterns. In this system, a database containing the trained student's face. A camera installed in the college campus captures the face of all the student in the classroom and other places too. This face image is processed using FRCNN algorithms to detect faces and to mark the attendance automatically in an excel sheet. The system records the entire class session and identifies when the students pay attention in the classroom, and then reports to the facilities and also this system can record violations of classroom that is absence, roaming around the college campus during the class hours and send alert message to the H.O.D. This dynamic attendance system uses face recognition as an important aspect of taking attendance which saves time and proxy attendance

and is avoided. The system identifies faces very fast needing only 100 Proceedings of the milliseconds to one frame and obtaining a high accuracy. Our face recognition model has an accuracy rate of 98.87%.

CROP PREDICTION FROM MULTIMODAL DATA USING DEEP LEARNING CLASSIFIERS

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Abstract

Crop prediction is crucial for agricultural planning and management, particularly in the face of climate variability and demand fluctuations. This paper presents a methodology for crop prediction leveraging deep learning classifiers and multimodal data fusion techniques. The proposed approach integrates diverse data sources including soil attributes, weather patterns, historical crop yields, and satellite imagery. Deep learning architectures are employed to extract hierarchical features from each modality, capturing both spatial and temporal dependencies. Furthermore, a fusion strategy is devised to combine information from multiple modalities, enhancing prediction accuracy and robustness. The model is trained and evaluated on a comprehensive dataset spanning multiple growing seasons and geographical regions. Experimental results demonstrate the effectiveness of the proposed methodology, surpassing traditional methods and achieving high prediction accuracy across various crops. The developed framework holds promise for improving agricultural decision-making and promoting sustainable farming practices. The methodology integrates diverse datasets including soil characteristics, climate patterns, historical yield records, and satellite imagery. Experimental results demonstrate the effectiveness of the proposed approach, outperforming traditional methods and achieving high prediction accuracy across various crops and regions.

DEPLOYING A MEDICAL ARTIFICIAL INTELLIGENCE SYSTEM FOR COVID-19 COMPUTER-AIDED DIAGNOSIS THROUGH AI-ASSISTED CT IMAGING ANALYSIS

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Abstract

Among the most effective tools available to doctors for detecting the new Coronavirus Disease 2019 (COVID-19) using medical imaging modalities are computer-aided diagnostic (CAD) systems. In this work, we demonstrate the integration and dependable and efficient implementation of a cutting-edge artificial intelligence system intended to automatically analyze CT scans, providing infection probabilities for the prompt identification of COVID-19. It is expected that the proposed system, which includes both segmentation and classification components, will improve the overall efficiency of COVID-19 detection and shorten the time it takes for physicians to detect the virus. We have effectively overcome a number of obstacles, including data security, data inconsistency, anonymization, and validating the model's time-effectiveness. This has allowed us to deploy the system in a dependable and scalable manner on both cloud and edge environments. Furthermore, each 3D object is given a likelihood of infection by our AI system.

ENHANCING SECURITY IN CLOUD-BASED HEALTH RECORDS THROUGH BLOCKCHAIN INTEGRATION

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Abstract

In modern healthcare systems, online diagnosis heavily relies on real-time data collection through Internet of Things (IoT) devices, such as body sensors and software. This data fuels rapid decision-making during diagnosis. However, the sensitive nature of this data and diagnosis results introduces significant risks of privacy breaches or hacking incidents, potentially resulting in misinformation or severe consequences. Third-party cloud services further compound these concerns regarding data protection. Moreover, many IoT devices lack standard security measures due to resource constraints. To address these challenges, it is crucial to prioritize accuracy, adaptability, low computation time, and implement effective anonymity procedures. This necessitates the development of a robust algorithm that ensures secure access to health records, with a focus on leveraging blockchain technology. To overcome these shortcomings and ensure the secure storage of patient health data, this study advocates for the establishment of a resilient three-tier architecture empowered by blockchain technology. This approach aims to bolster security measures, preserve data accuracy, and streamline access to health records while safeguarding patient confidentiality.

IMAGE VACCINATOR AN IMAGE TAMPER RESILIENT AND LOSSESLESS AUTO-RECOVERY USING INVERTIBLE NEURAL NETWORK

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Abstract

Today, people frequently interact with their families, friends, and colleagues through online social networks (OSN).People enjoy posting and sharing their photos in online communities, blogs, and content sharing sites. The problem addressed in this project is the susceptibility of digital images to tampering, which compromises security and privacy. Traditional image forgery detection methods face challenges in reproducing original content after manipulation. This project introduces an advanced Image Immunization System leveraging Invertible Neural Networks.

LAWYER BOT: AN AI-POWERED VIRTUAL ASSISTANT FOR ACCESSIBLE LEGAL GUIDANCE AND PROMOTION OF LEGAL LITERACY IN INDIA

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Abstract

This project introduces Lawyer Bot, an innovative AI-powered virtual assistant designed to address the challenges individuals face in accessing basic legal information and guidance. With the rising costs associated with professional legal services, Lawyer Bot aims to provide a cost-effective solution for minor legal issues and promote legal literacy. The system employs natural language processing (NLP) and Bidirectional Encoder Representations from Transformers (BERT) to facilitate conversational interactions. Users can input queries related to Indian laws and sections, describing their concerns or problematic situations. Lawyer Bot AI Legal Aid leverages its training to offer accurate information and suggest appropriate steps.

RESTORE SIGHT FOR BLINDNESS USING VISION TRANSFORMER

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Abstract

Visual implants are intended to produce an artificial vision leading to some levels of functional vision restoration. It uses 60 microelectrodes implanted in the retina and can improve the quality of life of visually impaired people by making them experience light even if they were in the dark for many years. Due to the limited number of microelectrodes of existing visual system stimulator, the artificial vision they permit has very low resolution. Many researchers have worked on improving the artificial vision created with low resolution implants by using image processing and machine vision algorithms. Users express dissatisfaction with the Retinal Prosthesis System due to the low resolution of phosphine images, highlighting the critical need for focused research to enhance visual clarity and improve overall user satisfaction. This project proposes a simulation of the artificial vision in which the information synthesized by the system to the visually impaired user using a visual implants generated low resolution phosphene image. By employing Vision Transformer (ViT), the method extracts valuable information about individuals surrounding the visually impaired user, such as their count, familiarity, gender, estimated ages, facial emotions, surrounding objects and approximate distances. This data, derived from camera frames on the user's glasses, is utilized to generate signals fed into a visual stimulator, presenting a promising approach to enrich the visual experience for individuals with visual impairments. For each feature, an appropriate algorithm is selected based on its accuracy and time complexity to enable affordable real-time implementations in an autonomous portable system. The

proposed system conveys important information about the people around a visually impaired person through audio and to make that person more comfortable to communicate with other people. Thus, this project can be considered for some next generation visual implant systems.

SCHEMESBOT: INTELLIGENT CONVERSATIONAL INTERFACE FOR ACCESSINGTAMIL NADU GOVERNMENT SCHEMES

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Abstract

Tamil Nadu government has implemented a variety of schemes across sectors to address the diverse needs of its citizens. These encompass education, healthcare, agriculture, social welfare, infrastructure, and more. A significant portion of the population remains unaware of the diverse range of government schemes across sectors such as education, healthcare, agriculture, social welfare, and infrastructure. To bridge this information gap, this project is to propose the development of a user-centric chatbot that uses the NLP. The implementation of an NLP-based chatbot can enhance transparency in the communication of government initiatives.

SMART DEVICE SECURITY UNITS IN ICU WITH ACCESS OVER PATIENT DATA MONITORING   SYSTEM

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Abstract

Smart device security units is critical for ensuring the protection of sensitive medical data and the overall safety of patients. Implementing smart device security units in an Intensive Care Unit (ICU) with access to patient sensor data monitoring systems necessitates a robust framework to safeguard sensitive healthcare information. This ensures that even if data is intercepted, it remains secure and accessible only to authorized personnel. Key considerations involve implementing robust encryption protocols to secure the transmission and storage of patient data, preventing unauthorized access and potential breaches. Implementing smart device security units in an Intensive Care Unit (ICU) with access to patient sensor data monitoring systems necessitates a robust framework to safeguard sensitive healthcare information. To uphold data integrity and confidentiality, it is imperative to employ end-to-end encryption for all transmitted and stored data. This ensures that even if data is intercepted, it remains secure and accessible only to authorized personnel. Access control measures should be stringent, allowing only authorized healthcare professionals to access patient sensor data. Integrating data encryption with blockchain technology in the security framework of an Intensive Care Unit (ICU) represents a sophisticated approach to safeguarding sensitive medical information. Data can be secured using Elliptical curve cryptography.

VOICE ASSISTANT TECHNOLOGY ENHANCES COMMUNICATION AND ACCESSIBILITY FOR   AMYOTROPHIC LATERAL SCLEROSIS (ALS) PATIENTS

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Abstract

The purpose of this study is to determine whether voice assistant technology can help people with Amyotrophic Lateral Sclerosis (ALS) communicate more effectively. Patients with ALS have a severely limited capacity for effective communication due to the gradual impairment of speech and movement abilities. The development and application of a customized voice assistant for ALS patients' particular requirements is the main goal of our project. We evaluate the voice assistant's efficacy in helping ALS patients with communication activities using a thorough methodology that includes user testing and evaluation. Our findings demonstrate how voice assistant technology may greatly improve accessibility and quality of life for people with ALS.

FACE MASK DETECTION AND FACE MASK REMOVAL USING GAN

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Abstract

This paper introduces a dual-component deep learning model for face mask detection and unmasking faces using Generative Adversarial Networks (GANs). The face mask detection component utilizes a robust convolutional neural network (CNN), which proves crucial for enforcing compliance with face mask-wearing mandates in public spaces, especially during ongoing health crises. The face mask detection system helps to identify whether a person is wearing a mask or not and it also performs facial recognition when the person's face is unmasked, retrieving their name from a database. This functionality encourages individuals to wear masks during health crises, thus contributing to public health efforts. The face mask removal component is trained on a diverse CelebA dataset of masked and unmasked faces. The GAN employs a conditional framework to produce realistic facial features while preserving individual identity. Face mask removal reveals a person's face from a masked image and can be used in security services, such as criminal identification or unknown person identification. By combining computer vision with various deep learning techniques, this system enhances security measures and provides leads on intruders.

Difficulties in Research and Architecture for Blockchain-Based Cloud Computing

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ABSTRACT

Blockchain technology is a distributed ledger that keeps track of all the information about the transactions that are conducted and shared around the network's nodes. Consensus systems verify every transaction made within the system, and once data is recorded, it cannot be changed. The key technology underlying Bitcoin, a well-known digital money, is blockchain technology. "Cloud computing is the practice of storing, managing, and processing data using a network of remote servers hosted on the internet instead of a local server or a personal computer." Numerous issues remain, including data security, data management, compliance, and dependability. In this post, we've discussed a few of the major issues the cloud is facing and some suggested fixes by Combining blockchain technology with it. In order to demonstrate their superiority, we usually go at a quick overview of past research that concentrated on blockchain integration with the cloud. Additionally, we have created an architecture in this study that reveals the connectivity between blockchain and cloud.

BUILDING AN AI-POWERED SENTIMENT ANALYSIS TOOL FOR SOCIAL MEDIA

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ABSTRACT

While social media offer great communication opportunities, they also increase the vulnerability of young people to threatening situations online. Recent studies report that cyber-bullying constitutes a growing problem among youngsters. Implement Semantic approach with classification algorithm using Deep learning algorithm to classify the messages whether is positive or not Block friends by predefined threshold value.

Power Quality Enhancement in Sensitive Local Distribution Grid Using Interval Fuzzy Logic Controlled DSTATCOM

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Abstract

In the current scenario, integration of renewables, growth of non-linear industrial and com-mercial loads results in various power quality issues. Among commercial utilities connected to the grid, hospital-operated loads include sensitive, linear, non-linear, and unbalanced loads. These loads are diver seas well as prioritized, which also causes major power quality issues in the local distribution system. Due to its widespread divergence, it leads to harmonic injection and reactive power imbalance. Distribution Static Compensator (DSTATCOM) is proposed as a solution for harmonic mitigation, load balancing, reactive power imbalances, and neutral current compensation. The present work utilizes Interval Type-2 Fuzzy Logic Controller (IT2FLC) with Recursive Least Square (RLS) filter for generating switching pulses for IGBT switches in the DSTATCOM to improve power quality in the Local Distribution Grid. The proposed approach also shows superior performance over Type 1 fuzzy logic controller and Conventional PI controller in mitigating harmonics. For effective realization, the proposed system is simulated using MATLAB software.

Solar Based Wireless Charging of E-Vehicles with Battery Fault Protection in Road Sides

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Abstract

Static wireless charging is becoming popular all over the world to charge the electric vehicle (EV). But an EV cannot go too far with a full charge. It will need more batteries to increase its range. Dynamic wireless charging is introduced to EVs to capitally increase their driving range and get rid of heavy batteries. Some modern EVs are getting off this situation. But with Dynamic WPT the need of plug-in charge and static WPT will be removed gradually and the total run of an EV can be limitless. If we charge an EV while it is driven, we do not need to stop or think for charging it again. Eventually, in the future the batteries can be also removed from EVs by applying this method in everywhere. Wireless charging needs two kinds of coils named the transmitter coil and the receiver coil is proposed.

The Progression of Load Redistribution Attacks in Cyber-Physical Power Systems

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Abstract

The frequency, scope, and severity of cyber-attacks on Smart Grids have increased, drawing greater attention. A crucial aspect of Smart Grid cyber security is integrity, ensuring protection against unauthorized manipulation of information. One particular type of attack within Smart Grids is Load Redistribution (LR) attacks, a subtype of False Data Injection Attacks (FDIA), representing a more realistic threat to data integrity in measurements. Since the initial research on LR attacks in 2011, the study of LR-based cyber-attacks has expanded significantly. This paper contributes to the coordinated effort in this field by presenting a comprehensive taxonomy of LR attacks, aligning various attributes with existing literature. Additionally, it identifies open issues and suggests research directions to guide future investigations and further exploration of this rapidly evolving domain.

AI IoT with Industrial Workers Safety Assurances in Oil and Gas Industries with Device Fault Environmental Fault and Alert System

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Abstract

The Industrial safety is one of the main aspects of industry specially coal mine industry. Underground mining hazards include suffocation, gas poisoning, object fall, roof collapse and gas explosion. This system provides a wireless sensor network for monitoring real time situation of underground mines from base station. The main reason for death of miners is that, due mine fall down, poison gases and fire accidents. To overcome this problem the system, provide emergency alert to the supervisor if person in danger by any reason. The system uses WIFI technology for transmission of data from underground mine to base station.

An IoT- Based Intelligent Street Lightning System for Energy Conservation

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Abstract

The Energy conservation is an important matter as resources are decreasing at an alarming rate and this would create a lot of problems for the next generations. To overcome from this issue, a proper energy saving method and automatic lighting control needs to be implemented. This work proposes a model for modifying Street lights illumination using sensors at minimum electrical consumption as well as elimination of manual operation. In this work the LED lights are used as streetlights, LDR sensor is used for detecting light intensity for differentiating between daytime and night-time and IR sensors are used to sense vehicle movements. If presence is not detected, all nearby streetlights remain in the dim mode, which is 30% intensity for pedestrians, and only illuminate at 100% intensity when presence is detected.

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Turbofan Engine Remaining Useful Life Prediction Using Machine Learning

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Abstract

This paper proposes a novel approach for predicting the remaining useful life (RUL) of turbofan engines using machine learning techniques. Turbofan engines play a critical role in various industries, including aviation, where accurate prediction of their remaining useful life is essential for maintenance scheduling and cost optimization. Traditional methods rely on pre-defined threshold-based approaches or physical modelling, which may not fully capture the complex degradation patterns of turbofan engines. In contrast, machine learning offers the potential to capture intricate relationships within the data to predict RUL more accurately. In this study, historical sensor data from turbofan engines are utilized to train machine learning models, including regression, classification, and deep learning algorithms. Feature engineering techniques are employed to extract relevant information from the sensor data, and model performance is evaluated using appropriate metrics. The proposed approach aims to provide accurate RUL predictions, thereby facilitating proactive maintenance strategies and minimizing operational downtime and costs associated with turbofan engine failures. The effectiveness of the proposed method is demonstrated through experimental results on real-world turbofan engine data, showcasing its potential for enhancing predictive maintenance practices in various industrial settings. Therefore, this project focuses on the design of intelligent decision support for monitoring the turbofan engine performance using a machine learning algorithm with higher accuracy.

Design of a Three Phase High Voltage Gain Converter for Fuel Cell

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Abstract

Generally, the power generating from the Fuel cell is an electrochemical reaction between H2 and oxygen and it generates electric energy, and the by-product is water vapour. However, the output from the fuel cell systems is very low, then it becomes necessary to connect more number of cells in series to improve the output. The proposed method electrically divides the fuel cell stack into different sections, and each stack is powered by a direct boost inverter. This project proposes a concept of high voltage dc-dc boost converter topology for a three-phase system to a typical output voltage from the fuel cell as a stand-alone supply. The main advantage of the proposed boost inverter method include ability to deliver the operations of both boosting and inversion of the power in only one stage, compactness, and economical. The output voltage from the fuel cell is a voltage-controlled method and output from the battery is a current controlled method. Analysis, and Simulation are taken from a 2kW prototype.

Optimal Load Forecasting of Regional Distribution Network Using GWO Algorithm

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Abstract

Load forecasting is an important component for power system energy management system. Precise load forecasting helps the electric utility to make unit commitment decisions, reduce spinning reserve capacity and schedule device maintenance plan properly. Besides playing a key role in reducing the generation cost, it is also essential to the reliability of power systems. Load forecasting plays an important role in power system planning, operation and control. Planning and operational applications of load forecasting requires a certain 'lead time' also called forecasting intervals.

We present in this work a method for forecasting long-term electric load based on dragonfly algorithm. The proposed dragonfly algorithm is implemented on real time data of 110/22 kv substation at Panruti from 2021 to 2023. Electricity demand predictions have been made for next 10 years from 2024 to 2033.

The proposed grey wolf algorithm is found to be highly accurate with a Mean Absolute Percentage Error (MAPE) is 6.36. The proposed dragonfly algorithm has a computation time of approximately 10 seconds.

Optimization of DG Allocation in Distribution Network by Antlion Algorithm

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Abstract

This work presents a performance enhancement of a radial distribution system using simultaneous reconfiguration, optimal placement of Distributed Generation using Ant lion optimizer and PV array using antlion optimization algorithm. The purpose of this paper is to reduce real power loss, improved voltage profile increased load balance. Here result proved that simultaneous reconfiguration along with optimal placement of capacitor and PV array is more efficient than Single objective optimization. Also the results obtained from differential evolution algorithm are more efficient than other method. The test system considered here is IEEE 33 bus system. This proposed approach was implemented in MATLAB software. The modified the differential evolution algorithm has been applied here successfully to minimize real power loss because it does not barrier factors or cross over rates because the objectives and constraints are dealt separately. The main advantages of this algorithm is continuous guiding search along with changing objective function because power from distributed generation is continuously varying so this can be applied for real time applications with modifications. This algorithm here is tested for a standard 33 bus radial distribution system for loss minimization and test result here shows that this algorithm is efficient and suitable for real time applications.

Improved Single Stage Transformerless Buck-Boost Inverter for Electric Vehicle Charger

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Abstract

As electric vehicles (EV) continue to gain market traction, more research is being conducted in the control of the power conditioning system. The design and implementation of a single-stage transformerless buck–boost converter for electric vehicle (EV) charger is done in this work. Being different from conventional H-bridge inverters, the proposed converter operates like buck–boost dc/dc converters instead of buck dc/dc converters. As a consequence, the advantages of a buck–boost dc/dc converter, i.e., the arbitrary relationships between its input voltage and output voltage, are still applicable to the proposed electric vehicle (EV) charger. Specifically, it remains in normal operation even when the peak ac output voltage is higher than the dc-link voltage. Simulation results are finally presented to illustrate its effectiveness.

Design of a Wireless Electric Vehicle Charging Systems using Interleaved Boost Converters

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Abstract

Electric Vehicles (EVs) provide solutions for the conservation of conventional energy resources, pollution reduction for a safe environment, and zero-emission vehicles. EV charging can be done in two ways, either wired or wireless. Wired charging has barriers like high cost, limited consumer knowledge, limited driving range, etc., when compared to wireless charging. Moreover, wireless charging can provide automated charging, which is more safe and convenient. A wireless EV charging system employing an Interleaved Boost Converter (IBC) as the DC-AC converter is discussed along with its performance analysis. A performance comparison of conventional Boost Converter (BC) with IBC is done, which shows that the structure of the IBC reduces current ripples and losses, thus improving the overall system efficiency. The simulation results are presented to prove the effectiveness of IBC in the application of Electric Vehicle Wireless Charging Systems (EVWCSs).

Dragonfly Optimization Algorithm Based Allocation and Sizing of Economic FACTS Under Contingency Condition

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Abstract

This paper proposes an application of dragonfly algorithm for Economic flexible AC transmission system devices placement/sizing in power system network. The identification of overloaded lines is based on computation of severity index. The objective of the proposed approach is to alleviate the transmission line overload by placing the FACTS device on optimal location subjected to the power balance, voltage and generator limit constraints. In the dragonfly algorithm, the objective function of a given optimization problem is based on static and dynamic swam behaviour of dragonflies. The effectiveness of the methods is demonstrated for all possible line contingencies in IEEE 30 bus system. However, dragonfly algorithm-based generation approach removes the line overloads with minimum losses when compared to other approaches.

Optimizing Combined Emission Economic Dispatch Problem Using Political Optimizer Algorithm

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Abstract

The cost of generating electrical energy from different sources tend to differ from one power plant to another depending on the energy source used and amount of emissions produced by each individual power plant. As a result of different operation cost, the economic dispatch considering emissions techniques are normally applied in order to optimize the power systems aiming at reducing the operation cost and pollutant emissions.

The expansion in electrical generation contributes to large extent an increase of greenhouse gases emissions which are causing global warming, ozone layer depletion and air pollution.

Fuels are the major source of electric energy generation, 42% of total global electricity generation is from coal which is the primary fuel globally. As a result of high dependability on fuel for electric generation, the electric energy is too expensive due to high expenses incurred by generation companies on emissions fees and purchase of fuels.

In this paper, the mitigation of the discussed situation was done through the implementation of developed whale search algorithm in economic dispatch considering emissions. The results of the developed method were compared to others reported in literature and found to be promising in terms of electric generation cost and emissions reduction.

Microgrid System with Demand Response Program using Grasshopper Optimization Algorithm for Economical Operation

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Abstract

A Microgrid system's load demand often fluctuates hourly. The Microgrid involves distributed generations like fuel cells, Microturbines, Wind Turbines, Photovoltaic Cells and Storage Systems etc. Utilities establish different prices at various times based on the fluctuation of the load demand curve, this is referred to as electricity price based on time-of-use (TOU). The primary goal is to find the optimal operation of DG's in microgrid using Gross Hopper Optimization Algorithm and to formulate the problem as a non- Linear constraints objectives optimization problems to minimize the total operating cost . Here many cost factors taken into account include fuel costs, fined pollution costs, operating and maintenance costs, depreciation costs, etc. This paper shows optimal schedule of PV, FC, MT and WT in microgrid for a day in grid connected mode. The total cost of DGs in microgrid and power cost to the grip for the proposed method for a day is 1141.41566 $ and -94.43061 $ respectively. Suppose if the total generated power from the FC and MT is not sufficient to meet the load demand, then the remaining required power is imported from the main grid to satisfy the total load demand.

Automatic Solar Cleaner and Solar Tracking Based on Arduino

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Abstract

Now a day's solar power is very helpful in our life. This power is used in many ways such as homemade electrical appliances, vehicles, satellites and industries etc. The objective is to have solar output maximum all day long, this occurs when the panel tracks the sun and rotates the accordingly, to receive sunlight to the fullest extent always during the day time. This movement is achieved by installing a couple of servo motors with the solar panel that changes it's direction according to the positioning of the sun. There are basically three major parts in this work, sensor, Arduino and two servo motors. Atmega328 Arduino have been used for this purpose. It receives sensor output signal and controls servo motors according to the assigned program. One servo motor is used horizontally to move panel upward and downward. The other is used vertically from left to right direction. As the solar panel is connected in servo motor so the position of solar panel is same to the servo motor. Since the maximum solar ray is fallen down on the solar panel module so that maximum power output can be achieved.

Optimal Network Reconfiguration for Loss Minimization of Distribution System Using Cheetah Optimizer

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Abstract

A distribution system's network reconfiguration (NR) is the process of changing the status of the switches to change the topology of the feeders. Using optimal NR at various network load levels, an economical way for improving the voltage profile and reducing power loss in distribution systems. A new metaheuristic cheetah optimizer based on the corporate rank hierarchy is used to solve the optimization problem in order to find the optimal radial distribution network. The proposed method is evaluated at three different load levels on a standard IEEE 33-bus test system, and the simulation results are compared to those of other optimization methods, demonstrating that the proposed method improves the system voltage profile while minimizing losses and power costs, establishing that this technique is effective in finding the best result.

Interconnected Hydroelectric Power System with Superconducting Magnetic Energy Storage Units, Load Frequency Control

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Abstract

In the power system, any sudden change in the load leads to deviation in frequency and tie-line power flow. So, Load Frequency Control (LFC) is a significant issue in power system operation and control. This paper deals with the Load Frequency Control in an interconnected two area hydro-power system with Superconducting Magnetic Energy Storage (SMES) units, to stabilize the system frequency oscillations. Expected that all the areas in a system are operate at same frequency because the traditional approach for interconnection of hydro systems turned out to be unsuccessful. The projected work consist of two area interconnected hydro-hydro power system with SMES units has been designed to improve the dynamic performance of the system. The simulation result shows that the hydropower system with SMES units yields a better dynamic performance in terms of system oscillations, peak overshoot and settling time.

Non-Isolated High Step-Up DC-DC Converter with Minimum Switch Voltage Stress

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Abstract

The article discusses the PV nursed energy effective, ultra-fast, high power, high gain DC-DC converter for EV charging with MPPT through the Hybrid Simplified Firefly and Neighborhood Attraction firefly (HSFNA) algorithm. The Single-Ended Primary Inductor Converter (SEPIC) is used because of its efficient MPPT operation with ultra-high gain with high efficiency and easy control system. The continuous input current, high current handling capability, and DC voltage with good quality power are required for charging the EV battery. Though there are numerous isolated dual bridge unidirectional converters available for EV charging, the high current demand for EV batteries cannot be met. The proposed converter provides higher current charging for the battery on demand by looking into the various control parameters. An ideal PV module is assumed to study the operation of the proposed converter, and an additional HSFNA algorithm supports the global maximum power point under various operating conditions like partial shading. The simulation of the proposed converter is carried out and the results are discussed.

Ultra Fast Charging E – Vehicle Batteries from PV using DC – DC Converter

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Abstract

A new high step-up DC-DC converter topology combining a charge pump mechanism with a standard inductor- based Buck cell is here presented. Its main advantages are: minimum switch voltage stress, given by the input voltage, and reduced energy in the magnetic element compared to a conventional Boost converter designed for the same voltage gain. The proposed topology is derived through a modification of the basic voltage-doubler charge pump cell that, thanks to a coupled inductor, allows to make the flying capacitor voltages dependent on the switch duty-cycle. Both capacitor charging and discharging paths benefit from the inherent leakage inductance of the coupled inductor, with consequent soft diode turn off with no reverse recovery problems and ringing free operation. A proper design of the Buck inductance permits a quasi square wave operation, thus allowing a zero-voltage turn on of the switches. Suitable design criteria are proposed so as to achieve the desired converter operation mode, without need for any iterative process. Experimental results based on a 44V to 400V - 300W prototype confirm the theoretical analysis and expectations, showing a quite flat efficiency curve that stays above 90% down to one tenth of the nominal power.

Cognitive Smart Street Lighting Solution

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Abstract

A smart city is an urban area that uses different types of electronic data collection sensors to supply information used to manage assets. it is seen in a number of cities that the street light is one of the huge expenses in a city. The expense spent on the street light can be used for other development of the nation. Currently a manual system is used where the light will be made to switched ON/OFF i.e. the light will be made to switch ON in the evening and switched OFF in the morning. Hence there is a lot of wastage of energy between the ON/OFF. This is one of the major causes of shifting to the automatic system, since there is less wastage of power and thus saving a lot of monetary expenses. In this proposed system, we aim to create a smart system for cities that will automatically detect faults in street lights, track their precise locations in real-time, and streamline the maintenance process for efficiency. The system will utilize featured technologies like sensors and connectivity to identify issues with street lights, such as malfunctions or failures. Once a fault is detected, the system will point the exact location of the problematic street light. In advance technology, Machine learning algorithm play a crucial role in analyzing vast amounts of data collected from sensors embedded in street lights. The AI-powered solution continuously monitors street lights enabling timely identification and resolution of issues.

AI Based Auto Micro Irrigation System

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Abstract

The aim of this project is to ease the mechanism of micro irrigate the plants , with the help of automatic plant watering system which automatically sense the needed water level and ON & OFF the water pump depending on the moisture content of the soil, which is continuously sensed by the soil moisture sensor. The system utilizes artificial intelligence (AI) for the analysis of environmental, soil, weather, and crop data and it find the plant growing level by collecting the data which connect the plant and soil. AIDS provides real-time monitoring of key irrigation parameters, allowing farmers to enhance their irrigation operations. Our Project proposes real-time plant health data monitoring with Digital Twin with Augmented Vision for the screening of plant growth disease. For faster action in agriculture in a land, it generates a scan able Augmented Vision (AV) code print. Also, the agricultural sensor data's also uploading to server system by IoT. The owner of the land will scan the AV code with all different lands AV code using android app scanner available, immediately the DT vision Software System fetch the respective lands senor values from the server also according to the sensor values and database data's the DT vision Software System will show us the details in real-time images normal and disease datasets.

AI-Driven Alarms for Enhanced Industrial Security

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Abstract

This project illustrates a precarious industrial environment monitoring and control for this monitoring information concerning safety and security. The proposed system uses a combination sensor network node with a system architecture and concept implementation, which are described mainly for an industrial safety monitoring scenario. The information is gathered by the deployed sensor network with focus on four main conditions: gas leakage and oil. This Project also enables an easy to use user interface and the accessibility of data through standards-based web server technologies. It is the most effective and most economical means of equipment safety monitoring. The Raspberry Pi Pico W serves as the central control unit, running the software application responsible for collecting sensor data, processing it, and controlling the connected devices. It communicates with the Gas sensor (MQ2) to detect the presence of harmful gases in the environment. If the gas concentration exceeds a predefined threshold, indicating potential danger, the Buzzer is triggered to emit an audible alarm, alerting the residents

AI Enabled Human Tracking System Using Drone

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Abstract

Drowning people in India approximately around 38000 peoples per year leads to dead finally because of, we have insufficient water rescue or timely emergency response to search and rescue team during emergency, also the lack of information to the rescue team about the drowning people place. We should believe that a few seconds' difference could have saved a person's life. The timely information conveyed to the rescue team is also an important criterion for drowning to dead rate being very higher. In the mission of searching and rescuing, it is often faced with the situation that the area to be searched is large and the target to be searched is small. Combined with object detection technology, this project proposes a method for searching drowning people and reduce the drowning to death rate. The detection accuracy of the improved algorithm for human targets at sea is improved, which has a good detection effect. The drone with detecting and alerting with voice message to the Rescue Team at remote end with required all details about the drowning people make sense for faster rescue and save as the highest accuracy. The camera detection of the rescue Drone had a proper in that the range of the active camera and the speed of the video with Wi-Fi to the control room also optimal for the detection to work properly.

ROBOVAC

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Abstract

The automatic floor cleaning robot using Raspberry pi is a innovative solution for efficient and autonomous floor cleaning. In this robotic system the Raspberry microcontroller is used to control wireless communication, sensor integration, and motor control, allowing for precise navigation and effective cleaning performance by integrating various sensors such as ultrasonic sensor. The robot can perceive its environment and navigate through obstacles while avoiding collisions. Additionally, the use of actuators and motors controlled by the Raspberry pi enables the robot to perform cleaning tasks with precision. Overall, the automatic floor cleaning robot utilizing Raspberry pi offers a promising solution for enhancing efficiency and convenience in floor maintenance. The entire system works in Green energy such as solar energy to charge the battery. AI technology allows the robot to automatically navigate to power source and charge the entire system

Smart Irrigation

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Abstract

Countries are working into making agriculture more sustainable by integrating different technologies to enhance its operation. Implementing improvements in irrigation systems is crucial for the water-use efficiency and works as a contributor to Sustainable Development Goals (SDGs) under the United Nations specifically Goal 6 and Target 6.4. This paper aims to highlight the contribution of SMART irrigation using Internet of Things (IoT) and sensory systems in relation to the SDGs. The study is based on a qualitative design along with focusing on secondary data collection method. Automated irrigation systems are essential for conservation of water, this improvement could have a vital role in minimizing water usage. Agriculture and farming techniques is also linked with IoT and automation, to make the whole processes much more effective and efficient. Sensory systems helped farmers better understand their crops and reduced the environmental impacts and conserve resources. Lastly, the challenges and benefits for the implementation of sensory based irrigation systems are discussed. This review will assist researchers and farmers to better understand irrigation techniques and provide an adequate approach would be sufficient to carry out irrigation related activities. Farming ancient cannel irrigation to smart irrigation for paddy to reduce the water wastages by the crop, using of AI and IOT recent technology, to make cost effective and easy to access by the farmers and easy user interface of the total system.

Smart Street Light Automation

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Abstract:

As an important part of a smart city, smart street lighting uses wireless IoT sensors, Zigbee, GPRS, Lora, and Bluetooth communication technology to connect the street lamps in the city in series, forming the Internet of things, and realizing the remote centralized control and management of street lamps. According to the traffic flow, time, weather conditions, and other conditions, the scheme can automatically adjust the brightness, and remote-control lighting, abnormal will take the initiative to alarm but also can cooperate with other sensors to play the function of anti-theft and remote meter reading.

Smart street lighting using IoT can effectively control energy consumption, thus enhancing the level of public lighting management, decreasing the cost of maintenance and management, and using the calculation of sensory information processing and analysis to make intelligent responses and intelligent decision support, making the city road lighting to achieve a "smart" state. The smart street light can be managed in a unified manner through the intelligent street lighting control platform and the street lamp controller to achieve the "three-in-one" effect of remote lighting monitoring, intelligent management and control, energy saving and emission reduction.

1 VR Dream World

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Abstract:

Virtual reality (VR) is a powerful and interactive technology that changes our life unlike any other. Virtual reality, which can also be termed as immersive multimedia, is the art of simulating a physical presence for the audience in places both real and imaginary. It usually involves two senses namely sight and sound. The key property that distinguished VR from all previous media types is "presence". Presence is the psychological sense of „being there", of actually being immersed in and surrounded by in the environment. This discussion is an attempt to give an overview of the current state of environment-related VR, with an emphasis on live VR experiences. The technology, art and business of VR are evolving rapidly. The various fields of VR are discussed to geta better view about it. The next development based on virtual reality is augmented reality.

Smart Farming

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Abstract

Smart irrigation systems are a new technology that uses sensors and weather data to optimize watering schedules for crops. These systems can save water and energy while also improving crop yields. Smart irrigation systems use a variety of sensors to monitor soil moisture, weather conditions, and plant growth. We also used a mobile application (iOS) for the data dump. The data from these sensors is retrieved and processed by a computer model, which changes the irrigation requirement accordingly. For example, if the weather forecast predicts a lot of rain, the system will reduce or shut off irrigation to save water. Additionally, smart irrigation systems can be integrated with other technologies, such as weather forecasting and precision agriculture, to further improve efficiency. Overall, smart irrigation systems have the potential to revolutionize agriculture by reducing water usage, improving crop yields, and increasing efficiency.

Smart Ambulance and Emergency Medicine

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Abstract

Wireless telemedicine is becoming an increasingly important part in providing a wide range of health care services for on-scene paramedics carrying out emergency rescue. As far as the paramedics are concerned, any information related to diagnosis needs to be made available for initial treatment. This chapter provides an in-depth discussion on using IoT for emergency support by gathering information about the patient through analysis of medical images and data collected from a variety of biosensors as well as on using a case study of providing emergency support to an asthma sufferer where it is known to be difficult for differentiating asthma and other forms of chronic obstructive pulmonary disease (COPD) in an on-scene setting. This chapter takes an in-depth look into the use of IoT technology for diagnosis and prognosis of COPD in supporting paramedics.

Modified Dipole Antenna For 5G IoT Applications

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Abstract

Antenna plays a major role in communication systems, and it is a device which converts electrical power into radio waves (vice versa). It is used in transmission of radio receiver and transmitter. An antenna is a device that is made out of a conductive, metallic material and has the purpose of transmitting and receiving electromagnetic waves, usually radio wave signals. For 5G IoT devices, antenna design parameters include compact size for integration, multi-band operation for compatibility, high efficiency for power savings, and directional radiation patterns for improved coverage. A milli meter-wave wideband wide beamwidth modified angled dipole antenna is proposed for 5G milli meter-wave(mm-W) IoT applications. The modified angled dipole antenna which has a   dipole arm that is bent once more perpendicular to the ground plane compared to the existing angled dipole is proposed to improve not only the beamwidth but also the S11 bandwidth.

Landslide Monitoring and Notification Using IoT

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Abstract

Hazards from landslides are everywhere. Landslides are more likely to occur on steeply sloped hillsides. For several case studies throughout the globe, researchers have performed landslide prediction, detection, and monitoring. The major goal of researching landslide detection is to stop natural disasters by seeing their early movement. This will lessen or prevent the landslide's fatalities among humans. Finding a method for the sensing components to react promptly to data changes and transmit the perceived data to the data analysis centre is another goal. The Wireless Sensor Network (WSN) and the Internet of Things serve as the foundation for the Implemented system (IoT). This technology is inexpensive, reliable, and delay-effective. The suggested system makes use of accelerometer and soil moisture sensors. While the accelerometer measures ground movement, moisture sensor data reveal the amount of moisture in the soil. The measurements that exceed the established criteria warn nearby residents to take precautions.

Design of Real Time Vision System Based on Mixed Reality (MR)

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Abstract

For tracking it generates a scan able Mixed Reality (MR) code print. Also the wearable bio-medical sensor data's also uploading to server system by IOT. By our proposed system, the every public individual must have their own printed or soft copy based MR code with them.Whenever peoples entering any public places like Shopping Mall, Theatre, Amusement park, Airport, Bank, farmers Market, hairdresser, electronic store and cafeteria they have to show their own MR code to the MR vision camera cum scanner available and database data's the MR vision Software System will show us the details in real-time images for normal datasets.

Speed Management and Collision Prevention Using AI And IoT

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Abstract

Revolution comes all over the world. Road transportation has become the most valuable element of modern communication. With the increase in population, traffic jams and road accidents have become a massive issue. Most of the time, people can't get advanced traffic jam alerts. As a result, after moving into an area, we noticed a traffic jam. At present situation the human beings are faced many accidents during the road ways transportation. The increasing number of vehicles on Indian roads and low traffic rules enforcement lead to multiple human-error induced crashes and fatalities. At the same time, they lose our life and valuable properties in those accidents. For this reason, traffic accidents involving driver fatigue and driver carelessness of traffic rules follow. In this project, a Multi-tasking Convolutional Neural Network (MConNN) model is proposed to detect traffic sign and vehicle parameters like vibration and position. Traffic sign and physical characteristics are utilized for driver's model. Changes to these characteristics are used to monitor vehicle state and speed control. In this project, a new detection scheme MConNN is proposed to accurately achieve real-time speed detection, classification of small traffic signs and driver state of drunk and vehicle parameters. Here implements this project in real time using Webcam and also extend this system with embedded application to reduce the speed and stop the vehicle while the abnormal activities were detected.

Design and Development of Writing Robot Using Speech Processing

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Abstract

In the present education scenario, the disabled students are facing difficulties in writing examinations with the help of scribe which increases the gap between education and disabled students. This may lead to an increase in the number of dropouts from schools and colleges. Our proposed system aims to help such disabled students to take-up their examinations easily through speech processing and robot technology. Our proposed system is an interactive system in which students can hear the questions and speak out the answers in a systematic order after which the whole transcript is mailed to the teacher which is then engraved by the robotic arm on a paper. At the end of examination, the answer sheet of the student comes out as softcopy as well as hardcopy. To implement the proposed work, we have used a software unit which uses python library speech recognition and hardware unit which uses Arduino Uno and CNC shield. The proposed system has a Word Error Rate of 21%.

Implementation of 64- Bit Parallel Prefix Adder Using Verilog for MAC Unit Applications

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Abstract:

The binary adder is a digital circuit that implements the arithmetic sum of two binary numbers supported with any length is known as binary adder. In most of the digital circuit design, particularly those of Digital Signal Processing, the binary adder is crucial component. Ripple Carry Adder is a traditional adder, its parallelism is limited, as each stage depends on the completion of the previous stage which can lead to inefficiencies in high performance computing applications. So that the computational complexity of the Ripple Carry Adder is O(n). In order to decrease the delay, we use Parallel Prefix Adder. It is an adder which uses prefix operation, in order to do efficient addition. They offer improved speed by executing addition operations in parallel. The complexity of Parallel Prefix Adder is O (log n). It is also known as the Kogge Stone Adder, employs a parallel prefix computation technique to efficiently compute the sum of multiple number in parallel. The qualitative analysis of a Parallel Prefix Adder involves measuring its increased performance in terms of speed, area, and power consumption. The quantitative analysis of Parallel Prefix Adder involves decreased delay. Parallel Prefix Adder are commonly used in various Digital Signal Processing (DSP) and some of the applications are MAC unit, Graphical Processing Unit (GPU), High Performance Computing (HPC). These are examined in study along with its comparison to the simple Ripple Carry Adder. These design with different bit width were put into practice, on a Xilinx Spartan 3E FPGA and a high-performance logic analyser will be used to assess delay.

FPGA Implementation of High-Performance BCD Adder using three input XOR gate and majority gate

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Abstract:

Binary Coded Decimal (BCD) adders are digital circuit that perform addition operation on BCD numbers. BCD adder is used in computer and calculators that perform directly in decimal numbers system. Majority-**m**of-three gates (MAJ) can be realized natively by lot of new emerging technology. Even while multiple MAJ Gates can be used to construct enhanced gates like exclusive-OR (XOR) gates, there are many effective XOR designs that are directly generated from the physical characteristics of cutting-edge of methodologies. This work introduced multi-digit binary coded decimal adder (BCD) design in this brief, which are based on MAJ gates and three-input exclusive-OR (XOR3). The suggested multi-digit BCD adder may result less space and lesser delay compared to the existing conventional BCD adder.

Design and Development of an Emergency Communication System for Hilly and Forest Region Using Wusn Technology

[1]Dr.A.Uma Maheswari ,   [2]P.M.Bharath,   [3]S.Keerthika

Abstract:

The proposed method consists of two elements: a transmitter and a receiver based on the Wireless Underground Sensor Network (WUSN) technique. During emergencies, users need to press the panic button.Wireless Underground Sensor Network (WUSN) is one of the recently developed technique that can be used for this application. This is a specialized form of soil data communication that primarily focuses on transmitting data in soil regions.The panic button, integrated into the transmitter, is pressed during an emergency.The transmitter is then inserted into the soil,facilitating the transmission of data to the receiver. The receiver subsequently sends message to the base station for communicating to any mobile device. The transmitter's functionality is based on magnetic induction.Within WUSN s various switches have been incorporated to send templates, addressing health condition and emergency needs, by pressing the relevant switches.Our system presents advanced channel. These models consider the characteristics of electromagnetic (EM) wave propagation in soil and their relationship with the frequency of these waves, as well as the soil composition.

Smart Load Management System for Overload Theft Prevention in Industrial Environments

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Abstract:

This project employs an Arduino Uno microcontroller to manage a household system, focusing on preventing overload theft. The system incorporates a current sensor to measure the current drawn by two AC bulbs with an operational voltage of 230. A relay is utilized to control the connection of loads. Under normal circumstances, when only one load is connected, the current value remains within the acceptable range. However, attempting to connect an additional load causes the current value to exceed the threshold, triggering a buzzer for an overload theft alert. The Liquid Crystal Display (LCD) serves as a monitoring interface, providing real-time updates on the current values of the connected loads. By integrating these components, the system offers a proactive solution to safeguard against overload theft in Industrials by continuously monitoring and alerting users to potential electrical overloads. The Arduino Uno-based Industrial system is designed to address overload theft concerns in industrial settings. The incorporation of a Liquid Crystal Display (LCD) serves as a user-friendly interface, providing real-time updates on the current values of connected loads. In the event of an attempt to connect an additional load causing an excessive current draw, the system triggers a buzzer alert, offering a proactive solution to safeguard against electrical overloads and potential theft in industrial areas.

Implementation of Rescue Robot for A Surveillance System using Internet of Things

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Abstract:

The main purpose of this project is to conduct surveillance in war zones and gather information from enemy territories. The robot is equipped with a metal detector, gas sensor, flame sensor and night vision camera, enabling it to detect and monitor explosives and individuals within restricted areas. The collected data is then transmitted to the command center for analysis. The night vision camera captures images and videos, which are subsequently transmitted to the receiving station. The flame sensor is used to detect the fire present and water is sprayed in the direction of fire. The metal detector is capable of identifying buried bombs and metallic objects, while the gas sensor detects the presence of hazardous gases in the environment, issuing an alert if necessary. These robots are incredibly valuable both in the present and the foreseeable future.

An Intelligent Waste Bin Designed for A Safe Disposal of Infectious Medical Waste

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Abstract:

There has been a rise in medical cases worldwide in recent times. These medical cases are a result of improper hospital waste disposal. Medical wastes that contain hazardous wastes that can spread various viruses are not properly managed. Medical waste is a type of waste produced in healthcare facilities, including clinics, hospitals, and labs. Medical waste may include substances that can contaminate the environment, such as lead, mercury, and other dangerous substances that seep into the ground and water. Those who live nearby may also experience health issues as a result of this pollution. The environment and public health may be at risk from infectious or dangerous materials found in medical waste. Hospitals may have hazardous waste from the following sources: pharmaceutical waste (old, contaminated medications, and chemotherapy drugs), radioactive waste (items containing radioactive isotopes, such as medical equipment used in radiation therapy or nuclear medicine), and chemical waste (expired or unused chemicals, such as laboratory reagents and solvents, that can pose a risk to human health and the environment if not properly managed.

IOT Based on Ventilator Using Arduino for Sensing Blood Oxygen Level Monitoring System

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Abstract:

The ventilator we here design and develop using arduino encompasses all these requirements to develop a reliable yet affordable DIY ventilator to help in times of pandemic. We here use a silicon ventilator bag coupled driven by DC motors with 1 side push mechanism to push the ventilator bag. We use toggle switch for switching and a variable pot to adjust the breath length and the BPM value for the patient. The entire system is driven by arduino controller to achieve desired results and to assist patients in COVID pandemic and other emergency situations.

Turbofan Engine Remaining Useful Life (RUL) Prediction Using Machine Learning

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Abstract:

Predicting the RUL of the Turbofan Engine is an important research area to avoid downtime and failures. Predictive Maintenance is the process of predicting malfunctions using data from equipment monitoring and process performance measurements. The conventional approach to monitoring a turbofan engine's performance is unreliable and more prone to failure. Therefore, this project focuses on the design of intelligent decision support for monitoring the turbofan engine performance using a machine learning algorithm with higher accuracy.

Integrated Renewable Energy Charging System for Electrical Vehicles

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Abstract:

High levels of emission on the earth and depletion of fossil fuels, sustainable environment is a real case, e-vehicles technology has grown up and become the coming of age transportation system that reduces global emissions. On road mileage must sufficiently high. Reduced charging station dependency. This system deals with charging method by increasing the EV range by having a smaller number of charging stations and also without increasing battery capacity. This charging mechanism comprises of an integrated system.

Design of a Cost-Effective Floating Waste Cleaning Robot

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Abstract:

Plastic garbage in reservoirs causes significant harm to water quality, aquatic life, and the entire ecosystem. This paper presents a low-cost water waste cleaning robot to collect floating waste in ponds and lakes, composed of commonly available low-cost materials requiring little human labor. This study aims to develop a robot that can collect floating trash in place of humans and evaluate the performance of the proposed system. This automatic system is constructed of floatable material and will float on the water to gather waste materials. A simple smartphone application is used to control the robot's cage-like framework, resulting in an extremely userfriendly interface. The waste trapped inside will have to be manually taken out of the bot before a second launch. Successful experiments have been made to collect different types of plastic waste in a small water body. The robot's operating range and battery life are measured to ensure an efficient cleaning process in terms of time. Furthermore, the operator may adjust the robot's speed to make movement simple and precise.

Investigation of Material Removal Rate and Surface Roughness during Electrical Discharge Machining of WS$_2$/Cu Composite

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Abstract

Present scenario, new materials are developed with improved in the strength are required numerous industries owing to their incomparable properties. Hence in the present study WS$_2$ / Cu composites has been developed powder metallurgy technique is being used in advanced and complex applications which usually demands for higher accuracy. Conventional machining of such composites does not provide higher accuracy, due to their hardness deteriorates the tool life. Electrical Discharge Machining (EDM) is suitable non-conventional machining process for such composites to remove unwanted material in the form debris to satisfy the present demands in manufacturing industries such as better finish, low tolerance, higher production rate, miniaturization etc. The present study investigates the influence of major EDM parameters like applied current, pulse on time and pulse off time on MRR and Ra.

Keywords: Electrical discharge machining (EDM), material removal rate, surface roughness.

Design and Analysis of Gravity Based Energy Storage Systems

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Abstract

The increasing demand for continuous energy supply is being met by renewable energy sources. However, harnessing energy from these sources necessitates the use of energy storage systems like Battery Energy Storage Systems (BESS), Compressed air systems, Mechanical systems, and Hydraulic systems. This paper delves into the investigation and analysis of a Gravity-based energy storage system, focusing on the development of a model-based representation. The primary aim is to enhance the overall concept and efficiency of the system. Gravity-based energy storage systems leverage the force of gravity to store potential energy. The mechanism involves elevating a heavy object to a considerable altitude and subsequently releasing it to generate electricity. By lifting the object, potential energy is stored, which is then converted into kinetic energy as the weight descends, thus producing electricity. The paper will provide further insights into the specific gravity-based energy storage system being examined, considering various designs and configurations. Furthermore, it will compare and contrast this energy storage method with alternatives such as battery storage and compressed air storage, outlining their respective advantages and disadvantages.

Key words:- Energy supply, Renewable energy source, Battery energy storage system, Efficiency, potential energy, kinetic energy, battery storage system.

Tribological performance of WC/Ni coating over a 7075 aluminium alloy by EDC process

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Abstract

Aluminium and its alloys are widely utilised in aerospace and automotive industries due to its exceptional qualities such as high strength, low density, non-magnetic properties, and great formability. However, their widespread adoption was restricted by their lack of surface hardness and wear resistance. Coating an aluminium alloy with a WC/Ni coating by means of electro discharge coating is one of the most efficient ways for enhancing wear resistance. Experiments were performed out under dry sliding conditions employing a pin-on-disc apparatus against an EN31 steel counter face with a normal load of 10-25N, sliding speed of 150-350 RPM, and sliding time of 2 - 4 min. The governing mechanism in each regime has been assessed using a wear mechanism map. Microstructural observations of worn surfaces have been identified using a scanning electron microscope.

Keywords: AA7075, wear transition map, wear mechanism map.

Assessment of the Effects of Engine Parameters on Performance and Emissions of Diesel Engine Operating With Biodiesel Blend

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Abstract

Alternative fuels are still needed to compensate for the energy shortages caused by fossil fuel depletion.The present study focuses on impact assessment of Millingtonia Hortens is (MH) biodiesel and its blends with diesel on diesel engine performance. The experimental investigation provides in depth detail of the biodiesel production process, evaluation of fuel properties and impact on engine performance. The experiments were conducted using BB, CC and DD blends of Millingtonia Hortensis (MH) biodiesel and these results were compared with the results obtained when the same engine was tested on conventional diesel fuel. Based on the experimental investigation the blends of Millingtonia Hortensis (MH) biodiesel can be used as fuel in diesel engine without making any modification to the diesel engine.

GRA PCA based optimization of process parameters in turning of AZ91D Magnesium Alloy

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Abstract

Nowadays, the utilization of magnesium (Mg) alloys is increased due to its various beneficial characters such as better thermal conductivity, minimum density, less weight, superior strength, good dimensional, stability nature, etc Magnesium alloy has wide applications in the production of aircraft engines, airframes, helicopter components, light trucks, automotive parts and computers parts for its attractive properties. In this work, turning experiments on AZ91D Magnesium Alloy are conducted using Taguchi L16 orthogonal array with four process parameters, viz. cutting speed, feed, and depth of cut and nose radius. The responses measured are machining force and surface roughness. Further, multi objective optimization is performed with hybrid grey relational analysis (GRA) and principle component analysis (PCA). From the ANOVA analysis it can be said that feed is the most influencing parameter followed by cutting speed, nose radius and depth of cut. The optimal parametric setting is cutting speed at 1000 rpm, feed at 0.06 mm/rev, depth of cut 0.3 mm and nose radius at 0.2 mm.

Keywords: Turning; machining force; surface roughness; GRA; PCA.

Smart Street Light and Fault Location Monitoring Through the Cloud over IOT

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Abstract

The IOT (Internet of things) is a blooming technology that has been widely used. The primary goal of this work is to provide control and identification of the damaged street light automatically. The proposed lighting system provides immediate information response about the street light fault. Normally, the damage of the street light is observed by getting the complaints from the colony (street) people. Whereas in this proposed work using LDR sensors these lights working status is easily captured without any manual interaction that reduces manual efforts and the delay to fix problems. It checks whether the street light is working or not at night time and will send the notification to the authorized person if there is a problem in particular street light and also the location are identified automatically using IOT.

Keywords — Internet of Things (IoT), Faulty street light detection, Energy efficiency,LDR sensors, Real-time monitoring, Automatic notification, Weather-based control, Street light automation

Evaluate the Mechanical Properties of Aluminium and Silicon Composite Material Using Analysis Tool

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Abstract

Within the last few years there has been a rapid increase in the utilization of Aluminium Composite, particularly in the automobile industries, due to their high strength to weight ratio, high wear resistance, low density and low coefficient of thermal expansion. The advancements in the field of application make the study of their wear and tensile behaviour of utmost importance. In this present investigation, Aluminium composite with Silicon were using Stir casting method. Compositional analysis and tensile studies of different alloys composition have shown near uniform distribution of Titanium in the prepared alloys. This paper discussed the material for replacing the piston material by the composite of Aluminium-Silicon material and to evaluate the Mechanical properties of the model composite plate.

An investigation of the effects of load, sliding velocity, and distance on the wear behaviour of Al6061–6wt% composite

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Abstract

In this work, the impact of dry sliding wear process factors on the wear rate and coefficient of friction of Al6061 with 6wt. % CSA composites was investigated. These parameters included load, distance, and sliding velocity. Response surface methodology was used to identify the key variables for maximizing wear rate and minimizing coefficient of friction. The experimental procedure was designed with a second-order face-cantered central composite architecture. Topsis multi-criteria decision-making was applied to optimize a dry sliding wear process parameter with multi-response characteristics, such as wear rate and coefficient of friction. TOPSIS multi-criteria decision-making was utilized. In model validation, sensitivity analysis was performed to determine the essential factors and rank them in order of importance. To validate the results, a confirmation test was conducted, and the obtained optimum parameters settings were found to be highly comparable to an ideal solution.

Investigation of process parameters on deposition rate and surface roughness by electro discharge coating AA7075 aluminium alloy

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Abstract

Now a days, surface modification techniques are a big part of making metals and alloys better on the outside. Even though various metals and alloys are coated using surface modification techniques, increasing the surface properties of the light alloys is difficult. To increase the surface properties of light alloys, electro-thermal techniques, namely electro discharge deposition (EDD), are suitable. Hence, in this investigation, a tungsten disulphide WS_2 (70%) and copper Cu (30%) composite coating was developed on AA7075 using electro discharge deposition. The WS_2/Cu composite electrodes were manufactured by the powder metallurgy method. The effects of discharge current, pulse on time, and pulse off time on deposition rate (DR) and surface roughness (Ra) have been studied. Tests were carried out according to the design matrix generated by central composite design in response surface methodology (RSM). An ANOVA was performed to determine the optimum parametric conditions for the responses. Pulse off time was the dominating parameter followed by discharge current and pulse on time for attaining the best response. Higher values of current, pulse on time, and pulse off time led to higher DR and Ra values. Higher discharge current produced sufficient spark strength that melted both the tool electrode and the work piece. The lower setting of parameters offered smooth roughness due to the even spark distribution. At a current of 8 A, bigger craters were observed due to the higher spark intensity that made the surface hard.

Keyword: Electrical discharge coating, Deposition rate, Surface roughness

Tribological Behaviour of WS$_2$/Cu Coated AA7075 by electrical discharge coating Process

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Abstract

Aluminium alloys possess wide potential in the automotive industry, particularly in hot reciprocating applications such as pistons for diesel and petrol engines due to its mechanical and physical properties. Though it has superior properties, it is susceptible to wear and corrosion. To address this issue, surface modification is required for to enhance the wear resistance and reliability of the component. Hence the current study focuses on enhancing the surface properties of aluminium alloys electro discharge coating (EDC) with WS$_2$/Cu. To access the coating performance, wear test was carried out with pin on disc machine with Taguchi L9 orthogonal array using the variables such as normal load, sliding speed and sliding time to study the effect of response. The results show that there is a strong relationship between wear behaviour and parameters. It was concluded that the wear rate increases with increase of normal load, sliding speed and sliding time. However coefficient of friction increases with increase of normal load and sliding time, decreases with sliding speed.

Keyword: Electrical discharge coating, wear rate, COF.

Performance Enhancement Study for Single Slope Solar Desalination Plant

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Abstract

The global imbalance between supply and demand for fresh water is being created by population growth, economic expansion, and global warming. Fresh water must be discovered, and the most likely sources are the world's vast oceans and seas, which can be distilled using a variety of means, including solar energy. The majority of existing desalination units are powered by fossil fuels. Multi-effect evaporation, multi-stage flash distillation, thin film distillation, reverse osmosis, and electro dialysis are all energy intensive and have high running costs. The usage of conventional energy sources (hydrocarbon fuels) to power these devices, on the other hand, has a negative environmental impact.

Solar distillation is a particularly appealing and straight forward technique among other distillation methods, and it is particularly well suited to small-scale units in areas where solar energy is abundant. The basic concept of harnessing solar energy to turn salty, brackish or contaminated water into potable water is actually fairly simple. Water evaporates when it is kept in a closed container in the open air. A solar still's purpose is to collect evaporated water by condensing it on a cool surface. Solar radiation is employed to speed up the evaporation process.

The ultimate goal of most solar distillation research is to enhance the distillate yield from the solar still. This is accomplished by either raising the water temperature or lowering the

temperature of the condensing cover. As a result, any new strategy should be able to efficiently achieve one of the two goals.

The goal of this research is to improve the productivity of a solar desalination plant by I increasing the temperature difference between water and glass, (ii) reducing heat losses from the still by using energy storage materials inside the basin, and (iii) studying other parameters such as water depth. The same design parameters are used to manufacture two single slope single basin solar desalination machines. On the single slope solar distillation system, several experimental studies were undertaken to improve productivity with various parameters such as the effect of water depth and energy storage materials.

Keywords: Solar, desalination, Distillation, Solar still, Slope, brackish and basin

Structural and Vibrational Analysis of Connecting Rod by Various Materials

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Abstract

The objective of this work is to carry out the structural analysis of a connecting rod made from three differing types of alloys. Connecting Rods has a wide use in all sorts of automobile engines acting as a crucial middle point between the piston and therefore the crankshaft of an engine of an automobile. It's liable for transmission of the up and down movement of the piston to the crankshaft of the Engine, by converting the reciprocating motion of the piston to the rotation of crankshaft. The performance of a rod in an engine depends on its design and weight. Hence, for the assembly of a Long-lasting, economical and light-weight rod, analysis and optimization become necessary. The material "structural steel" of rod is replaced with Aluminium alloy, Magnesium alloy, forged Steel and Titanium alloy material for rod. The model of rod is made in AUTOCAD and imported in ANSYS 2024 R1 workbench for static analysis. After analysis, a comparison is formed between an existing steel rod and therefore the four Composite rods in terms of Von Misses stress, equivalent strain, Strain energy and total Deformation. All these parameters also are found analytically and compared with results of Finite Element Analysis .All those results are within the range and therefore the values of these materials are found as compared of steel. The general work is split into three phases. First, concept and a review of existing material. Second, we do modelling and static structural analysis. Third, is comparison of elastic strain, total deformation, strain energy and maximum Von misses Stress value in alloy connecting rods. And finally random vibrational analysis is analysed.

Keywords: Connecting Rod, Piston, Crankshaft, Structural Analysis, FEA, Structural

Steel.

Optimization of machining parameters on SS304 material using orthogonal array method

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Abstract

In this paper, Taguchi techniques are applied to find out the surface roughness, material removal rate, and machinability in turning operation of SS304. L9 orthogonal array, S/N ratios and ANOVA are used to study the performance characteristics of cutting speed, feed rate and depth of cut as lathe parameter with tool flank wear width as response variable. The result of the analysis show that the selected machining parameters affect significantly the tool flank wear with of Tungsten Carbide cutting tool while machining SS304. And also indicate that the cutting speed is the most influencing parameter out of the three parameters under study. Surface roughness determines how a real object interacts with its environment. Rough surfaces usually wear more quickly and have high friction coefficient than smooth surfaces. The experiments were performed on SS304 Using Taguchi method. A three level, three Factor design of experiment prepared according to Taguchi orthogonal array L9 using Minitab 16 software. The Analysis of Variance (ANOVA) and Signal to Noise (S/N) Ratio was carried to find out the most significant factor and percentage contribution of individual factor for Surface Roughness and Material Removal Rate. Finally, the results are further confirmed by validation experiments or confirmation run.

Keywords: Taguchi method; CNC turning machine; Surface roughness; MRR; ANOVA Table; Minitab 16 software;

Analysis of Mechanical Properties of TiC Reinforced Aluminium Alloy Composites

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Abstract

In the present paper, the aluminium alloy i.e. AA 6061-T6 based composites reinforced with different weight fraction of TiC (2-3μm) particles (0%, 10%, 15% and 20%) was produced by stir cast technique and the effect of reinforced ratios on the mechanical properties and Tribological behaviour was examined. The test results shows that the increment in weight fraction of reinforcement particles in the matrix metal produced better mechanical properties like hardness, Tensile strength, Impact strength. SEM metallographic images and EDAX analysis evidences the homogenous dispersion of reinforcement in the matrix. The dry sliding wear behaviour shows that wear rate of the casted samples has decreased with the amount of reinforcement added. For the same working conditions wear rate increases with increasing load and with increasing speed.

Keywords: Metal Matrix Composites, AA 6061-T6-TiC, Mechanical properties, Tribological behaviour, Reinforcement

Investigation on Performance of Hybrid Natural Fibers Reinforced Polymers

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Abstract

Natural fiber reinforced polymer composites (NFRCs) have demonstrated great potential for many different applications in various industries due to their advantages compared to synthetic fiber-reinforced composites, such as low environmental impact and low cost. However, one of the drawbacks is that the NFRCs present relatively low mechanical properties and the absorption of humidity due to the hydrophilic characteristic of the natural fibre. One method to increase their performance is hybridization. Therefore, understanding the properties and potential of using multiple reinforcement's materials to develop hybrid composites is of great interest. This paper provides an overview of the recent advances in hybrid natural fiber reinforced polymer composites. First, the main factors that affect the performance of hybrid fiber-reinforced composites were briefly discussed. The effect of hybridization on the mechanical and thermal properties of hybrid composites reinforced with several types of natural fibers (i.e., sisal, jute, curauá, ramie, banana, etc.) or natural fibers combined with synthetic fibers is presented. Finally, the water absorption behaviour of hybrid fiber-reinforced composites is also discussed. It was concluded that the main challenges that need to be addressed in order to increase the use of natural-natural or natural-synthetic hybrid composites in industry are the poor adhesion between natural fibers and matrix, thermal stability and moisture absorption of natural fibers. Some of these challenges were addressed by recent development in fibers treatment and modification, and product innovation (hybridization).

Keywords: Natural fiber composites (NFC); hybrid composites; mechanical properties; thermal properties; water absorption

Structural Analysis of Car Crash Using Ansys

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Abstract

During an automobile crash, some parts in the front of an automobile body will have plastic deformation and absorb a lot of energy. Hence it becomes necessary to check the car structure for its crash ability so that safety is achieved together with fuel economy. A simple finite element (FE) model of a car is developed in ANSYS and it is solved for full frontal impact in ANSYS LSDYNA explicit code. Computational simulations and various results are plotted and analyzed. There are various test configurations. We have limited our analysis to frontal impact with a rigid wall at a speed of 35 mph, corresponding to a NHTSA (National Highway Traffic Safety Administration) full frontal impact. The current project discusses the development, modification, and analysis of a finite element model of car body using Titanium alloy Computational simulations and various results are plotted and analyzed. The crash analysis simulation and results can be used to assess both the crashworthiness of current frame and to investigate ways to improve the design. This type of simulation is an integral part of the design cycle and can reduce the need for costly destructive testing program.

Keywords: Structural analysis, Ansys, Car Crash

Synthesis and Optical Characterization of Barium Titanate (BaTiO₃) Nanoparticles by Solid State Method

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Abstract

The perovskite family includes a variety of titanates used in a variety of electrical ceramic applications such as electronic, electro-optical and electro-mechanical ceramic applications. Barium Titanate (BaTiO₃) is a member of a large family of compounds with the general formula ABO_3 called perovskites. This paper includes the study of the properties of Barium Titante (BTO) at different concentrations synthesized using the solid state method. The structural, morphological and optical properties of pure BaTiO₃ nanoparticles have been investigated by using X-ray diffraction (XRD), UV–Visible spectroscopy and Photoluminescence spectroscopy. X-ray diffraction (XRD) was used to study the structure and crystallite size of BTO nanoparticles. The results from X-Ray diffractogram shows that the particle size lies in the range 23 to 29 nm. Bandgap energy of the samples were calculated using UV– Visible spectroscopy. For pristine BaTiO₃ the bandgap is found to be 3.23 eV. It is observed that as the doping percentage increases the bandgap of the material decreases. Photoluminescence measurements revealed that the specimen show ultraviolet emission along with emission in blue region.

Keywords: BaTiO₃, Nanoparticles, Ceramics.

Comparative Study on Effect of Silver Doped Nickel, Lithium and Potassium Ferrites on the Removal of Pollutants from Industrial Water Waste

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Abstract

The aim of this research is to evaluate the effect of silver doped nickel ferrite, potassium ferrite and lithium ferrite on the removal of pollutants from industrial water waste. Silver doped Li, Ni, K Nanoparticles are synthesized by sol-gel technique. Structural and morphological behaviors of the synthesized nanoparticles are characterized by XRD, SEM, FTIR and Raman Spectroscopy. X-ray diffraction pattern shows a well crystalline $AgLiFe_2O_4$, $AgNiFe_2O_4$ and $AgKFe_2O_4$ powders in spinel cubic phase. The ion exchange process is widely used for the removal of heavy metals in the treatment of water waste due to its high treatment capacity, high removal efficiency and fast kinetics. The present study shows a very good removal of pollutants using Ag doped Ni, Li, K nanoparticles from industrial water waste.

Keywords: Nanoparticles, Pollutants, Industrial wastewater, Ferrites, Sol-gel, SEM.

Fiber Optic Ethanol Sensing Properties of ZnO-CeO$_2$ Heterostructure Nanocomposites

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Abstract

Heterostructure CeO$_2$-ZnO nanocomposites were synthesized by chemical precipitation method. The crystal structure, morphology and the functional groups were investigated by X-ray diffraction, Field emission scanning electron microscopy (FE-SEM). X-ray diffraction analysis confirmed the formation of CeO$_2$-ZnO nanocomposite. Crystallite size was found 20 nm. The FE-SEM study showed the uniform distribution of grains with spherical-like structure. Further, the clad modified fiber-optic sensor studies for ethanol sensing exhibits better sensitivity for the CeO$_2$-ZnO heterostructure nanocomposite compare to pure ZnO and CeO$_2$ nanoparticles.

Keywords: VOCs, gas sensors, CeO$_2$-ZnO composites, heterostructure.

Investigations on Crystal Growth Characterization of an NLO Organic Crystals of Hydrazide Derivatives Crystals

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Abstract

Hydrazides are the vital compounds which possess remarkable properties and are widely used in organic synthesis, analytical chemistry and medicine. In this, single crystals of a novel tosylhydrazide were grown via reflux method. The tosylhydrazide crystal was characterized using Fourier transform infrared spectroscopy (FT-IR), single crystal X-ray diffraction, powder X-ray diffraction (PXRD), UV-Vis absorption and scanning electron microscopy (SEM) techniques. Single crystal X-ray diffraction analysis revealed that tosylhydrazide belonged to the triclinic system with centrosymmetric space group. PXRD and SEM studies substantiated the good crystallinity of the as-grown specimen. Result of the UV-Vis absorption study proved higher transparent characteristics of tosylhydrazide crystals. Tosylhydrazide crystals showed higher transparent characteristics. Investigations of electronic properties confirmed the greater chemical stability and reactivity of hydrazide.

Keywords: Tosylhydrazide, Reflux method, NLO.

Green Synthesis, Characterization and Antibacterial Activity of Silver Nanoparticles Using Mukia Scabrella Leaf Extract

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Abstract

The present study reports an eco-friendly and rapid green synthesis method of silver nanoparticles. Silver nanoparticles were successfully synthesized using *Mukia scabrella* as reducing as well as capping agent simultaneously. Silver nanoparticles were characterized with the help of UV-Vis absorption spectroscopy, Fourier transmission infrared (FTIR) spectroscopy, X-ray diffraction (XRD), Scanning electron microscopy (SEM). The typical surface plasmon resonance of the Ag-NPs was observed at around 428nm. X-ray diffraction analysis confirmed and structural of silver nanoparticles was found in the form of face centered cubic (fcc), the particle size was expected in the range of 10-30nm. SEM image the presence of almost spherical in shape, and effective of the antibacterial activity were observed.

Keywords: Green synthesis, silver nanoparticles, *Mukia scabrella*, anti-bacterial activity, XRD, FTIR.

Investigations on Growth and Optical properties of potassium Boro-succinate (KBS) single crystals

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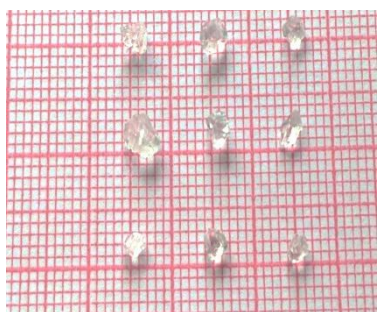
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Abstract

Single crystals of potassium boro-succinate crystal have been successfully grown from the aqueous solution by the reflux method. The FTIR spectrum shows the presence of functional groups in the crystals. UV-Visible absorption spectrum was observed to study the optical transparency of the grown crystals. The lower cut-off wavelength was around 270 nm. Etching studies reports the etch patterns of the present crystals. The etch pattern shows the defects in surface of the crystal like point dislocations, grain boundaries, etc. This shows how the crystals would have been formed layer by layer from the solution. The laser damage threshold analysis were carried out for the title crystals by using a Q-Switched Nd:YAG laser. The results show the enhanced property of the present crystals. Finally a photo luminous study has been carried out.

Keywords: Reflux method, LDT, Luminescence.

As grown crystal of KBS Etch pattern (10S) of KBS   **UV-Vis Spectrum of KBS**

Structural and Optical Properties of CeO_2 nanoparticles Adorned with Quantum Dots

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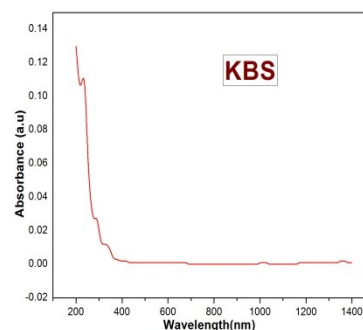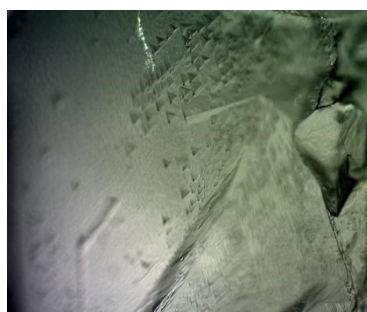
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Abstract

The fluorite cubic phase of bare cerium oxide (CeO_2) nanoparticles have been synthesized through a simple chemical precipitation method. The structural and optical details of nanostructures were characterized by X-Ray Diffraction (XRD) and Fourier Transform Infrared Spectroscopy (FT-IR) and UV-Vis absorption spectra respectively. X-ray diffraction results revealed that average grain size of CeO_2 quantum dots is about 7–8 nm. The functional groups present in the samples were identified by Fourier Transform Infrared Spectroscopy (FTIR) study. UV–vis analyses were carried out for band gap measurements. Band gap measurements calcined at $400^{\circ}C$ indicated band gap energy of 5.3 eV which shows 2.1 eV blue-shift (shift into smaller wave lengths) from that of the bulk CeO_2 which was reported earlier by others.

Keywords: CeO_2, Chemical precipitation, Quantum dots, Band gap.

Synthesis and Characterization of ZnO/CdO Composite Nanostructures via Chemical Precipitation Method.

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Abstract

CdO/ZnO heterostructures synthesized by a low-cost and environment-friendly strategy. The structural details of nanostructures are characterized by X-Ray Diffraction (XRD) and Fourier Transform Infrared Spectroscopy (FT-IR). The XRD results indicated that the heterostructures formed between the cubic structure CdO and hexagonal structure ZnO in the CdO /ZnO composites. The composites showed much higher performance than that of pure CdO and ZnO, which could be ascribed to the formation of heterojunctions in the CdO/ZnO composites. The functional groups present in the samples were identified by Fourier Transform Infrared Spectroscopy (FTIR) study.

Keywords: CdO, ZnO, heterostructures, composites.

Organic-Inorganic hybrids Based on Phenanthrene-Functionalized Gold Nanoparticles for OLEDs

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Abstract

The electroluminescence intensity of the phenanthrene-functionalized gold nanoparticles, PMPT-Au nanoparticles/CPB: Ir(PIA)$_2$ (acac) film, was increased by 4.9 times compared with control device, CPB: Ir(PIA)$_2$ (acac) due to coupling between the excitons of emissive layer and localized surface plasmonic resonance of PMPT-Au NPs. The maximum luminous efficiencies of devices II to IV with PMPT-Au NPs were 39.2 Cd A^{-1} (11.8V), 40.1 Cd A^{-1} (10.5V), and 43.1 Cd A^{-1} (9.0V), respectively. The increment of current efficiency with PMPT-Au NP coated devices was strongly related to the energy transfer between the radiated light generated from CBP: Ir(PIA)$_2$ (acac) emissive layer and localized surface plasmonic resonance excited by PMPT-Au NP layer.

Keywords: Exciton-SP coupling, current efficiency, LSPR enhancement, luminous efficiency, PMPT-Au NPs/CPB:Ir(PIA)$_2$(acac) film

Physico-Chemical Parameter Analysis of Ground Water from Cuddalore Town, Tamil Nadu, India

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Abstract

The objective of this study is to assess the water quality in the Cuddalore region, including its chemical composition, both qualitatively and quantitatively. Hence, a total of ten subterranean water samples were collected from various sites within the Cuddalore area and subjected to qualitative analysis. The water samples underwent analysis to assess various water quality including pH, total dissolved solids, salinity, electrical conductivity, sodium (Na), potassium (K), chloride (Cl), and hardness. The physicochemical metrics reveal that the quality of groundwater differs from one bore well to another. Elevated values of any parameters in a water sample indicate that the water is unsuitable for consumption.

Keywords: Water testing, Physico-chemical analysis, water quality, Cuddalore district

A Novel Imidazolium Supported Palladium-Chloroglycine Complex-Sonogashira Coupling Reaction

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Abstract

A simple, procedure has been adopted for the synthesis of room-temperature ionic liquids (RTILs) in high yields by reacting 1-methylimidazole and alkyl halides at 80ºC. Spectroscopic evidence of ionic liquid is obtained by FT-IR, HRMS and NMR. Which provides a simple strategy for the generation of a variety of new ionic liquids under environmentally benign condition, in future. Palladium immobilized [Cemim]Br was used as an organo-catalyst for the Sonogashira coupling reaction under solvent free condition at 25°C. By this protocol, different aryl halides were reacted with phenylacetylene in good to excellent yields with.

An efficient method for the oxidation of primary and secondary alcohols to aldehydes and ketones, respectively, with hydrogen peroxide under ambient temperature has been achieved. By applying catalytic amounts of Palladium-BIL (**Bifunctional ionic liquid**) in the presence solvent free condition, a variety of substrates were selectively oxidized without formation of ester as a by- product. The material also exhibited reusability as well as reaction time stability properties desirable for industrial applications.

Zero-Emission Vehicle Adoption Towards Sustainable Development

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Abstract

Electric vehicles (EVs) are a promising technology for achieving a sustainable transport sector in the future, due to their very low to zero carbon emissions, low noise, high efficiency, and flexibility in grid operation and integration. The present study shows the electric vehicle technologies as well as associated energy storage systems and charging mechanisms. Different types of electric-drive vehicles are presented. These include battery electric vehicles, plug-in hybrid electric vehicles and fuel cell electric vehicles. The topologies for each category and the enabling technologies are discussed. Various power train configurations, new battery technologies, and different charger converter topologies are introduced. Electrifying transportation not only facilitates a clean energy transition, but also enables the diversification of transportation's sector fuel mix and addresses energy security concerns. In addition, this can be also seen as a viable solution, in order to alleviate issues associated with climate change. Furthermore, charging standards and mechanisms and relative impacts to the grid from charging vehicles are also presented.

Green Chemistry-Current and Future Issues

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Abstract

The beginning of green chemistry is frequently considered as a response to the need to reduce the damage of the environment by man-made materials and the processes used to produce them. A quick view of green chemistry issues in the past decade demonstrates many methodologies that protect human health and the environment in an economically beneficial manner. This article presents selected examples of the implementation of green chemistry principles in everyday life in industry, the laboratory and in education. A brief history of green chemistry and future challenges are also mentioned.

Keywords: Green chemistry, green analytical chemistry, clean chemistry, atom economy, sustainable development.

PEG – Assisted Synthesis of ZnO-CdO Nanocomposites by Chemical Precipitation Method.

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Abstract

Bare ZnO, CdO nanoparticles (NPs) ZnO-CdO (NCs) were synthesized via controlled chemical precipitation route. The structural details of nanomaterials are characterized by X-Ray Diffraction (XRD). The surface morphology and particle size is investigated by field emission scanning electron microscopy (FESEM) and transmission electron microscopy (TEM). Similarly, optical properties were characterized by UV–Vis spectroscopy. The Xrd analysis revealed the presence of heterojunction frameworks in the ZnO-CdO nanocomposites.. The size distribution of ZnO-CdO nanoparticles ranged from 20-30 nm. These composites were dispersed uniformly on the ZnO-CdO heterojunction frameworks which confirmed by TEM analysis. The heterojunction nanocomposites materials can be a good candidate for the production of high-performance sensing applications.

Keywords: ZnO, CdO, Nanocomposites, Heterojunction.

Monitoring and Controlling Water Parameters Based on WSNs

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Abstract

Research works of Wireless Sensor Networks (WSNs) applications and its constraints solutions occupy wide area around the world and attract many researchers. In this paper, an important one of environmental WSN applications is presented that is the water monitoring applications. An efficient approach for monitoring and controlling water parameters in real-time is implemented utilizing merging between WSN and designed simple workstation. For implementation simplicity, two water parameters (pH and temperature) are monitored and controlled in the proposed approach. Most of past work of water monitoring presented different proposed monitoring scenarios for different water parameters only. This research work utilizes the concept of interactive WSN nodes. The interactive nodes interact with the monitored water parameters to control its value. In the base station, the collected data is analyzed and the real-time value of the monitored parameters appears on the designed Graphic User Interface (GUI). The GUI is designed using the Matlab program. Through the GUI, the operator can switch the control between automatic and manual. ZigBee module is used for implementing the wireless communications between the nodes and the workstation. Due to the cost and simplicity, two sensors only are used in the proposed approach. Different real-time experiments are performed to test and measure the effectiveness and performance of the presented approach. These experiments reveal that the presented approach is effective for water treatment and efficient more than the past proposed water monitoring scenarios.

Keywords: Environmental Monitoring, Water Quality, Interactive WSN, WSNs Applications, Interactive Sensing, Real-Time

IOT Based Nursing Activities Monitoring and Control system

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Abstract

IoT technology has emerged as a valuable tool in modern healthcare, providing real-time monitoring of patients, effective management of healthcare, and proper administration of patient information. The proposed system aims to develop a system that can prevent backward blood flow from stopping saline fluid, as well as monitor the temperature, heart rate, and oxygen level of patients by using multiple sensors like weight, temperature and heart rate, etc. Additionally, the proposed system can monitor the room temperature and humidity for contributing to the patient's overall comfort. In emergency situations, it includes an emergency push button for quick alert medical staff and initiates timely interventions. It is designed to support nurses and doctors in monitoring patients and providing timely interventions to prevent complications.

Synthesis and Characterization of CuO/ZnO Composite Nanostructures via Chemical Precipitation Method.

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Abstract

CuO/ZnO heterostructures synthesized by a low-cost and environment-friendly strategy. The structural details of nanostructures are characterized by X-Ray Diffraction (XRD) and Fourier Transform Infrared Spectroscopy (FT-IR). The XRD results indicated that the heterostructures formed between the cubic structure CuO and hexagonal structure ZnO in the CuO /ZnO composites. The composites showed much higher performance than that of pure CuO and ZnO, which could be ascribed to the formation of heterojunctions in the CuO/ZnO composites. The functional groups present in the samples were identified by Fourier Transform Infrared Spectroscopy (FTIR) study.

Keywords: CuO, ZnO, heterostructures, composites.

About College

Reading the signs of the times, the Congregation of the Sisters of St. Anne, Tiruchirapali has vowed to place the thrust on opting for the poor. It has been working for the cause of the education and the upliftment of the poor and the downtrodden. After a thorough study, reflection, prayer and discernment, we have proposed to extend our mission by establishing the professional bachelor degree programmes(B.E - Mechanical Engineering, B.E - Computer Science and Engineering, B.E - Electrical and Electronics Engineering, B.E - Electronics and Communication Engineering) in the name and style of St. Anne's College of Engineering and Technology, chiefly focusing on the option for the economically challenged people in the academic year 2009-2010.

Our aim is to give hope and dignity to the student community through education by means of which character is moulded, strength of mind is increased, intellect is enhanced and also by means of which one can stand on one's own feet. We train the youth to see the good in every human being and to take the best out of each individual, to inculcate a strong sense of values in every student and to help every person promote love, peace and justice in the society.

About Conference

Seventh National Conference on Advancements in Engineering, Science and Technology 2024 (NCAEST'24) will target state-of-the-art as well as emerging topics pertaining in the field of Science, Engineering and Technology and effective strategies for its implementation. It also provides a premier interdisciplinary platform for researchers, academicians, industry persons, practitioners, educators and students to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered, and solutions adopted in the fields of innovation.

The objective of this National conference is to provide opportunity for the participants to interact and exchange ideas, experience and expertise in the current trend and strategies. Besides this, participants will also be enlightened about vast avenues, current and recent technological developments in various domain and its applications will be thoroughly explored and discussed.

Contact