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2nd

INTERNATIONAL CONFERENCE

On

NEW TRENDS IN SCIENCE, ENGINEERING, TECHNOLOGY AND MANAGEMENT - 2025

(ICNTSETM'25) - HYBRID MODE (BOTH ONLINE & OFFLINE)

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25th & 26th APRIL 2025

P.S.V

COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)
(Accredited by the NAAC with 'A' Grade)
(An ISO 9001:2015 Certified Institution)
(Inclusion Under Section 2(f) & 12(B) of the UGC Act, 1956)
Chennai-Bangalore Highway,(NH 46),
Mittapalli, Balinayanapalli Post, Krishnagiri-635 108.

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About the Institution

P.S.V College of Engineering and Technology which has been Accredited by the NAAC with 'A' grade is run by St.Joan's Educational Trust, Dr.P.Selvam, the Founder of the Trust, is an academician with rich experience in teaching and having achieved an unenviable reputation in his own Profession. He is a keen social activist and visionary, felt that he should contribute his might to the betterment of the society as a part of his social commitment, this could be achieved by Promoting Educational Institutions that impact high quality knowledge at an affordable cost.

Globalization of Education and the Paradigm shift in teaching methodology have inspired the Trust to foster top-notch edification in multifarious spheres of learning. As a step towards materializing this dream, the Trust has started "P.S.V College of Engineering and Technology" to provide quality education and training to students in Engineering and Technology to prepare them to come up in the highly competitive technological fields, We aim at moulding students to become intellectually luminous, globally competitive, industry ready engineers and technologists. The academic ambience at P.S.V College of Engineering and Technology will steer the students to achieve their best.

ABOUT THE CONFERENCE

The International Conference on New Trends in Science, Engineering, Technology and Management (ICNTSETM-25) is being organized by P.S.V College of Engineering and Technology, Krishnagiri, Tamilnadu, India on 25th & 26th April 2025. The focus of an international conference generally centers on a specific theme or subject that resonates with the interest of its audience. It can vary greatly across disciplines but typically aims to address critical global issues, highlight emerging trends and foster opportunities for innovation and collaboration.This conference aims to bring and unite international scholars working in the fields of Artificial Intelligence, Machine Learning, Emerging Cellular Technology, Robotics & Automation, Creative & Innovative Management Practices and Sustainable Energy Materials.

The conference provides a platform for research scholars, faculty members, industry professionals, delegates, and students to interact and share their experiences and knowledge in the fields of Science, Engineering, Technology, and Management. Engineers, as professional practitioners of engineering, apply scientific knowledge, mathematics, and ingenuity to develop solutions to technological and societal problems. This conference offers young researchers opportunities to present their findings through oral presentations, enabling them to improve their research while gaining valuable insights. By bringing together experts and participants from various countries, the conference emphasizes innovative topics on an international scale, fostering collaboration and knowledge exchange.

We invite researchers, academicians, industry professionals, and students to contribute original research papers and case studies aligned with the following themes:

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Greetings from P.S.V College of Engineering and Technology !!

We are Proud to Host the International Conference on New Trends in Science, Engineering, Technology and Management - 2025. The International Conference is structured as keynote address followed by paper presentation. The Plenary keynotes will be addressed by eminent personalities. Papers are invited from post graduate students, researchers, academic institutions and R&D personnel.

The International conference aims at bringing researchers, academicians, practicing Engineers and industrialist from all over the country on to a common platform. The conference provides a national forum for researchers to exchange the ideas in emerging trends in various aspects of theories, experimentations, and computations, and computational methods in Science, Engineering, Technology and Management.

ICNTSETM'25

SECRETARY'S MESSAGE

Dr. S.VIVEK, M.A., EDMSL (UK).,M.B.A.(UK), Ph.D.
Secretary
P.S.V Group of Institutions

Greetings from P.S.V College of Engineering and Technology !!

ICNTSETM'25

It is a matter of great pride, privilege, and honour to invite you all to the International Conference on New Trends in Science, Engineering, Technology and Management (ICNTSETM'25) to be held on 25th & 26th April, 2025 in P.S.V College of Engineering and Technology, Krishnagiri.

It is an exciting time for academicians, Engineering professionals and researchers continue to grow and adapt systematic manuscript management, constructive and critical blind review process. The participants will exhibit their excellent discussion and exchange the technical challenges on Science, Engineering, Technology and Management to penetrate the innovations and hurdles for the upcoming technology.

This International conference will be highlighting issues on interest for research community in related fields by the renowned scholars across the globe. I congratulate all the members of the organizing committee making this conference a successful event.

PRINCIPAL'S MESSAGE

Dr. P. LAWRENCE, M.E., Ph.D.,
Principal
P.S.V College of Engineering and Technology

ICNTSETM'25

Dear Participant of the ICNTSETM'25

On behalf of the organizing committee, it is a great pleasure to invite you to be part of the International Conference on New Trends in Science, Engineering, Technology and Management - 2025 (ICNTSETM'25). We have fully integrated scientific and industry presentation into the core conference in order to showcase deployment of the very many innovative technologies that have emerged over recent years.

There is a pressing need for innovations in Science, Engineering, Technology and Management growth to meet potential targets for 2030 and beyond. There is an even more pressing need to integrate various perspectives of Engineering and Technology to attain the enormous output.

There will continue to be a strong focus in interactions between researchers, industry and policy makers for all branches of engineering, science and management that are contributing to the emerging innovations. We still need to focus on how scientific and engineering innovations can be more efficiently exploited, what are needs of the cutting edge industries leading the way with scaling up of technologies, what are the research priorities in the minds of industry and policy makers and how can environmental sustainability be maintained and simultaneously economic sustainability achieved.

Please have a close look at the International Conference and see how you can best contribute to the closer interaction whether you are a researcher, an industry person or policy maker working with biomass. We look forward to assembling an exciting and rewarding conference likely ICNTSETM'25

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DEEP FAKES DECTECTION BY IRIS ANALYSIS

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Abstract

Deepfake is an advanced technology that creates extremely realistic facial images and videos. This new technique operates under specific conditions and has a wide range of applications. For example, it can be used in the entertainment industry to create impressive visual effects or to insert actors into scenes convincingly. Similarly, in the film industry, deepfakes can help make movies by faithfully reproducing the appearance of actors who are not physically present. It is also useful for creating realistic digital avatars of people, which can be used in virtual environments, video games, or augmented reality applications. Recently, the emergence of new content generation models capable of creating impressively realistic images has been gaining momentum. Despite their advantages, they also cause significant issues when used maliciously, such as for identity theft, misinformation, and obscene depictions of well-known individuals. Therefore, it is crucial to implement effective methods to expose this generated content and thus reduce crime associated with deep fakes. This article presents a novel method for detecting fake content based on an in-depth analysis of the characteristics of eye irises. By applying a gradient map to the iris, it is possible to visualize the biological characteristics specific to eye irises, such as the round shape, identical reflections in the two irises of the same face, the size of the iris, etc. The gradient map highlights all the contours of the objects present in the iris; thus, the reflected light present in the corneas is represented by brighter pixels comparable to heat. We show that two irises of the same face are almost identical in shape, reflection, and size. The effectiveness of this approach is demonstrated using real and GAN generated facial images

Keywords: Deepfakes, gradient map, eyes, GAN, pupil segmentation.

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SENTIMENT ANALYSIS USING MACHINE LEARNING

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Abstract

A key field of natural language processing (NLP) is sentiment analysis, which uses machine learning methods to identify and categorize emotions in textual data. Some learning strategies used in sentiment analysis, with an emphasis on their performance, methods, and practical uses. We go over the efficiency of many supervised learning algorithms in sentiment classification tasks, including support vector machines (SVMs), random forests, and neural networks. With the increasing rate at which internet users create data on various platforms, it becomes crucial to analyse and know the sentiment of the people. This will assist the groups in taking charge of their activities and determining the next course of action. Through social media platforms, millions of people express their thoughts on a variety of daily topics that directly or indirectly affect them in the age of micro blogging, which has grown to be a very popular communication tool. These websites' data can be effectively utilized for social research or marketing. We have considered some approaches to sentiment analysis. ML classifiers have been used to do this. DL Models and polarity-based sentiment analysis are used to categorize user tweets as either "positive" or "negative." The goal of incorporating several model designs was to take into consideration the diversity of viewpoints and ideas found on these social media sites. These categorization algorithms may also be used to categorize real-time tweets on any subject.

Keywords: SVM, DL Models, Polarity-based sentiment analysis, NLP, Supervised learning algorithms.

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ARTIFICIAL INTELLIGENCE IN HEALTH CARE AND PREDICTIVE ANALYTICS

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Abstract

The integration of Artificial Intelligence (AI) in healthcare has significantly enhanced predictive analytics, early disease diagnosis, and personalized treatment strategies. This study aims to evaluate the effectiveness of AI-driven methodologies in predictive analytics for healthcare applications. The research focuses on assessing machine learning models in disease prediction, optimizing resource utilization, and improving patient outcomes. To achieve this, three widely used machine learning algorithms— C4.5 Decision Tree, Support Vector Machine (SVM), and Naive Bayes (NB)—were applied to healthcare datasets. These models were analyzed based on classification accuracy, interpretability, and efficiency in handling complex medical data. Among the tested models, the C4.5 Decision Tree exhibited superior performance, demonstrating high accuracy and transparency in decision-making. Its ability to generate human interpretable rules makes it a reliable choice for clinical applications, supporting physicians in making data-driven decisions. The findings suggest that AI-powered predictive models, particularly C4.5, can significantly enhance disease diagnosis and early intervention. This study recommends further exploration of hybrid AI models that integrate deep learning with decision trees to improve predictive performance. Additionally, implementing Explainable AI (XAI) techniques can enhance trust in AI driven healthcare solutions by providing transparent insights into model decisions. By adopting AI-based predictive analytics, healthcare institutions can enhance diagnostic accuracy, optimize treatment strategies, and facilitate proactive patient care.

Keywords: Artificial Intelligence, Predictive Analytics, Healthcare, Machine Learning, C4.5 Decision Tree, Support Vector Machine, Naïve Bayes, Disease Prediction, Explainable AI, Clinical Decision Support.

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AI AND BLOCK CHAIN FOR SECURE DATA TRANSACTIONS

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Abstract

The integration of AI and blockchain technology to enhance the security, efficiency, and transparency of data transactions. AI contributes through predictive analytics, anomaly detection, and intelligent automation, while blockchain ensures data immutability, decentralization, and transparency. The combination of these technologies provides a robust framework for securing sensitive data, reducing fraudulent activities, and improving trust in digital transactions.AI enhances blockchain by optimizing consensus mechanisms, detecting security breaches, and automating smart contract execution, ensuring adaptive and self-improving security protocols. Meanwhile, blockchain ensures transparency and prevents data tampering by maintaining a distributed and immutable ledger, allowing AI to access verifiable and trustworthy datasets. This integration not only strengthens cybersecurity but also introduces new possibilities for secure, decentralized AI-driven applications across multiple industries. Furthermore, this paper discusses the synergy between AI and blockchain, their practical implementations in financial services, healthcare, supply chain management, and cybersecurity, as well as the challenges and ethical considerations in their integration. Future research directions include addressing scalability issues, refining AI bias mitigation techniques, and enhancing the interoperability of blockchain networks with AI-driven systems. By leveraging the strengths of both technologies, AI and blockchain can revolutionize secure data transactions, ensuring a future of enhanced privacy, reliability, and operational efficiency.Artificial Intelligence (AI) and blockchain technology have emerged as revolutionary solutions to address security vulnerabilities in data transactions.

Keywords: AI, Blockchain, Secure Data Transactions, Smart Contracts, Decentralization, Secure Data Transaction,, Cyber security.

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NATURAL LANGUAGE PROCESSING AND ITS REAL TIME APPLICATIONS

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Abstract

Natural Language Processing (NLP) serves as a crucial link between human language and machine understanding, facilitating more intuitive interactions. Despite significant advancements, challenges remain in handling word-level, sentence-level, and semantic complexities. This paper traces the evolution of NLP over four key stages and explores essential elements such as Natural Language Generation (NLG). Recent innovations in transformer models and deep learning have improved applications like speech recognition, sentiment analysis, and virtual assistants. However, the practical application of these models often exposes limitations in their robustness and understanding of language. Use cases such as machine translation, chat bots, information retrieval, and software traceability highlight the growing importance of NLP. This study underscores the need for more robust systems, reviews current research, identifies gaps, and suggests avenues for future development.

Keywords: NLP, Machine translation, Chat bots, Information retrieval, Software traceability, Robustness.

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IOT FOR SMART CITIES AND HOMES

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Abstract

By allowing intelligent, networked systems that improve productivity, sustainability and quality of life, the Internet of Things (IoT) is transforming home living and urban of infrastructure. IoT applications that maximize resource usage, lower energy consumption, and enhance urban mobility include smart traffic management, waste monitoring, automated street lighting, and public safety surveillance in smart cities. Convenience, security, and the energy savings are offered by IoT-driven solutions in smart homes, such as voice-activated assistants, energy management, smart security systems, and automatic lighting. Sensor networks, wireless connectivity (5G, Wi-Fi, LoRa WAN), cloud computing, and edge AI form the foundation of the Internet of Things, allowing for automation and real-time data of the processing. For broad adoption, however, obstacles including data privacy hazards, this cyber security threats, high deployment costs, and interoperability issues need to be resolved. AI-powered IoT (AIoT), 5G expansion, and predictive analytics are set to further transform smart ecosystems. Governments and industries are investing heavily in IoT to build sustainable, data-driven cities while homeowners increasingly adopt smart devices for automation and energy efficiency. This explores the current Emerging trends like, technological foundations, challenges, and future potential of IoT in smart cities and homes, emphasizing its role in shaping a connected, intelligent, and sustainable future.

Keywords: IoT (Internet of Things),Smart Cities ,Smart Homes, Automation, Sensors & Actuators, 5G & Connectivity, AI& Big Data, Energy Efficiency, Security &Privacy, Edge Computing.

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DATA MINING AND ANALYTICS TECHNIQUES

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Abstract

Data mining and analytics techniques have emerged as pivotal tools in the modern data-driven landscape, enabling organizations to extract meaningful insights from vast and complex datasets. As the volume of data generated continues to grow exponentially, the need for effective methodologies to analyze and interpret this information has become increasingly critical. This paper explores the fundamental concepts, methodologies, and applications of data mining and analytics techniques, highlighting their significance across various domains, including business, healthcare, finance, and social sciences. The study begins by defining data mining as the process of discovering patterns, correlations, and anomalies within large datasets using statistical, mathematical, and computational methods. Key techniques such as classification, clustering, regression, and association rule mining are examined in detail, illustrating how they facilitate the identification of trends and relationships that inform decision-making processes. Additionally, the role of machine learning and artificial intelligence in enhancing data mining capabilities is discussed, emphasizing the shift towards predictive analytics and automated decision-making. Furthermore, the paper delves into the various stages of the data mining process, including data preprocessing, transformation, and evaluation, underscoring the importance of data quality and integrity in achieving reliable results. Real-world applications of data mining and analytics techniques are presented, demonstrating their transformative impact on industries.

Keywords: Data mining, analytics techniques, big data, machine learning, artificial intelligence, classification, clustering, regression, association rule mining, predictive analytics, data preprocessing, data quality, ethical considerations, real-world applications, decision-making.

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AI-POWERED REAL-TIME CYBER SECURITY THREAT DETECTION IN FINANCIAL SYSTEM

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Abstract

The banking and financial sector is confronted with increasingly sophisticated cyber attacks, including malware, phishing, and insider threats, that endanger data integrity and customer confidence. Conventional methods of cyber security do not adequately perform in detecting an attack in real-time due to the dynamic strategies employed by hackers. This paper presents an AI-based cyber security framework that utilizes machine learning (ML) and deep learning (DL) models to analyze network traffic, detect anomalous behavior, and forecast likely threats. With the integration of behavioral analysis, threat intelligence, and automated countermeasures, this solution enhances the security of financial transactions. A case study of fraud detection in banks explains how AI is able to effectively detect threats with high accuracy. The paper further touches on problems such as false positives, privacy issues with data, and attacks by adversaries and proposes possible solutions for improving AI-based cyber security for financial systems.

Keywords: Cyber security, Artificial Intelligence, Machine Learning, Deep Learning, Real-Time Threat Detection, Financial Security, Fraud Prevention, Phishing, Threat Intelligence, AI-driven Security.

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WIRELESS SENSOR NETWORKS AND THEIR APPLICATIONS

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Abstract

Wireless Sensor Networks (WSNs) are decentralized networks composed of spatially dispensed sensor nodes that reveal and accumulate environmental records those sensors speak wirelessly, enabling real-time facts transmission and choice- making in various domain names. With improvements in embedded structures, wi-fi verbal exchange, and facts processing, WSNs have emerge as important in various applications, together with environmental monitoring, healthcare, business automation, clever cities, and navy surveillance. WSNs perform the usage of small, low-energy sensor nodes ready with processing devices, conversation modules, and electricity resources. those nodes collaborate to shape self-organizing networks, decreasing the want for centralized manipulate. electricity efficiency, scalability, and security are key considerations in WSN design to ensure sturdiness and dependable statistics transmission. diverse communicate protocols, inclusive of Zigbee, Bluetooth Low power (BLE), and LoRa, optimize electricity intake and community overall performance based totally on software requirements. In environmental monitoring, WSNs are used for monitoring climate adjustments, detecting natural disasters, and tracking air and water satisfactory. limitations. Gadget mastering and synthetic intelligence are increasingly integrated into WSNs to enhance statistics processing, anomaly detection, and adaptive network configurations. As WSN generation evolves, its packages will keep to amplify, sustainability.

Keywords: Decentralized, Embedded, Scalability, Optimization, Predictive, Intrusion, Constraint, Harvesting, Anomaly, Adaptive, Surveillance, Infrastructure Automation, Longevity, Transmission.

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BIG DATA ANALYTICS AND BUSINESS INTELLIGENCE

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Abstract

This presentation explores big data analytics and business intelligence and their relationships. There are many tools to perform such as hadoop, spark, orange etc and algorithm such as FCFS, capacity scheduling, priority scheduling, shortest job scheduling etc. Business intelligence provides a framework that identifies the terms of evolution, applications, and emerging research areas. The opportunities associated with data and analysis which is often referred to as the techniques, technologies, systems, practices, methodologies, and applications that analyse business data to help a better understanding its business and market and make timely business decisions. Big data handles huge volume of data at high velocity and variety. Business Intelligence(BI) basically focuses on transforming raw data into usable, valuable and actionable information for decision making. The scientific inquiry in this interdisciplinary domain has had a long and successful history at the European Conference on Information Systems(ECIS).Big data analytics has the potential to help companies improve operations as well as secret correlations to make faster and intelligent decisions. The findings reveal that big data analytics has facilitated the extraction of information from the vast amount of data generated by businesses every second. This article shows an analysis of these technologies involved in the business intelligence of a current organisation.

Keywords: FCFS, BI, ECIS, HADOOP, SJS, CS, PS

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IOT AND IT'S APPLICATION

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Abstract

The Internet of Things(IoT) is a transformative technological paradigm that enables flawless connectivity between physical bias, detectors, and digital systems through the internet. By using real- time data collection, processing, and communication, IoT enhances robotization, effectiveness, and decision- making across colorful diligence. Its operations extend from smart homes and metropolises to healthcare, husbandry, artificial robotization, transportation, and environmental monitoring. In smart metropolises, IoT facilitates intelligent business operation, waste disposal, and energy conservation, leading to sustainable civic development. In healthcare, IoT- powered wearable bias and remote covering systems revise patient care, reducing sanitarium visits and enabling individualized treatment plans. also, IoTdriven smart husbandry optimizes irrigation, crop monitoring, and beast operation, adding productivity while conserving coffers.

Beyond these, IoT enhances artificial robotization by enabling prophetic conservation, force chain optimization, and real- time monitoring of ministry, significantly reducing functional costs and time-out. In the transportation sector, IoT- integrated vehicles and smart structure ameliorate road safety, navigation, and line operation. also, IoT plays a vital part in environmental monitoring by tracking air and water quality, disaster vaticination, and climate change mitigation. Despite its immense eventuality, IoT relinquishment faces several challenges, including data security pitfalls, interoperability issues, and high deployment costs. Addressing these enterprises through advancements in artificial intelligence(AI), EC, blockchain, and 5G networks will further enhance IoT's trustability, scalability, and effectiveness.

Keywords: Iot, Internet Of Things, Artificial Intelligence, Fifth Generation, Cyber Security, Edge Computing, Ipv4 – Internet Protocol Interpretation 4, Ipv6- Internet Protocol Interpretation 6, Aws – Amazon Web Services.

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AI IN AGRICULTURE

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Abstract

Revolutionizing Agriculture through AI as Precision Farming, Predictive Analytics, and Smart Monitoring .Harnessing AI for Sustainable Agriculture, This paper explores the transformative impact of artificial intelligence (AI) in modern agriculture. Traditional methods that farmers utilized were unable to meet these needs. New automated techniques were implemented.AI-powered crop monitoring and analysis enhances early disease detection and AI-enabled disease detection techniques that use computer vision to examine crop photos, enabling farmers to spot and treat plant infections early on while livestock monitoring & management ensure better health tracking of plants. AI-driven framework that automates soil analysis, making it easier to optimize fertilization strategies. It achieve by using machine learning algorithms to read sensor data and determine soil composition and nutrient level. Irrigation forecasting promotes water conservation by predicting moisture needs. Furthermore, AI-based harvesting automation improves the efficiency by determining the ideal time for crop collection. Our research aims to combine various technologies in order to improve agricultural output, encourage sustainable practices, and offer an entire solution to today's farming problems.

Keywords: Precision Farming, Predictive Analytics, Crop Monitoring, Disease Detection, Soil Analysis and Irrigation Forecasting.

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EFFICIENT FINE-TUNING OF LARGE LANGUAGE MODELS: REDUCING COMPUTE COSTS AND ENERGY CONSUMPTION

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Abstract

Fine-tuning Large Language Models (LLMs) requires substantial computational power and energy, posing challenges for sustainability and accessibility. As the demand for task-specific LLMs grows, optimizing fine-tuning methods to reduce costs and energy consumption becomes essential, especially in resource-constrained environments. This study explores parameter-efficient fine tuning techniques that minimize resource usage while maintaining model performance. We investigate methods such as Low-Rank Adaptation (LoRA), Quantized LoRA (QLoRA), Gradient Check pointing, and Zero Redundancy Optimization (ZeRO) to enhance efficiency. Experiments on models like LLaMA and GPT-3, tested on benchmark NLP datasets, show up to 75% memory savings, a 30% reduction in energy consumption, and a 35% improvement in training efficiency. These findings promote cost-effective and sustainable AI development. Efficient Fine-Tuning of Large Language Models: Reducing Compute Costs and Energy Consumption.

Keywords: Efficient Fine-Tuning, Large Language Models, Low-Rank Adaptation, Computational Cost Optimization, Sustainable AI.ng, Disease Detection

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5G AND BEYOND COMMUNICATION TECHNOLOGIES

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Abstract

The fifth generation (5G) of mobile communications networks is emerging as a revolutionary technology that will accelerate the development of smart cities and the realization of the information society. This paper aims to introduce 5G for non-specialists, and a survey of this new technology for those already familiar with mobile communications, covering the conceptualization and the core technologies underpinning 5G networks. The paper also discusses the status of the commercial roll-out of 5G until 2020 from a worldwide perspective and gives a future view of mobile communications beyond 5G. The rapid evolution of wireless communication technologies has led to the deployment of (5G networks), offering ultra-low latency, high data rates, massive connectivity, and enhanced reliability.

However, as the demand for seamless connectivity, IoT expansion, and immersive technologies (such as AR/VR and the meta verse) grows, researchers are already exploring, beyond 5G (B5G) and 6G networks spectrum efficiency, energy consumption, security, and network densification, which require breakthroughs in (AI-driven network optimization), edge computing, and sustainable infrastructure. The advent of 5G technology has revolutionized wireless communication by delivering ultra-low latency, high data rates, massive connectivity, and enhanced reliability. As 5G networks continue to roll out globally, research is already shifting toward Beyond 5G (B5G) and 6G technologies, which aim to further transform connectivity through advanced innovations.

Keywords: 5G, 6G, beyond 5G (B5G), Terahertz (THz), AI driven networks, IoT, Edge Computing, Intelligent Reflecting Surfaces (IRS), Ultra reliable Low-Latency Communication (URLLC).

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A STUDY ON NOVEL NETWORK INTRUSION DETECTION SYSTEM BASED ON MACHINE LEARNING ALGORITHM FOR CLOUD COMPUTING ENVIRONMENT

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Abstract

Cloud computing is an emerging choice among businesses all over the world since it provides flexible and world wide Web computer capabilities as a customizable service. Because of the dispersed nature of cloud services, security is a major problem. Since it is extremely accessible to intruders for any kind of assault, privacy and security are major hurdles to the on-demand service's success. A massive increase in network traffic has opened the path for increasingly difficult and broad security vulnerabilities. The use of traditional Intrusion Detection Systems (IDS) to prevent these attempts has proven ineffective. Therefore, this paper proposes a novel Network Intrusion Detection System (NIDS) based on a Machine Learning (ML) model known as the Support Vector Machine (SVM) and eXtreme Gradient Boosting (XGBoost) techniques. Furthermore, the hyper parameter optimization technique based on the Crow Search Algorithm is being utilized to optimize the NIDS' performance. Besides, the XGBoost-based feature selection technique is used to improve the classification accuracy of NIDS's method. Finally, the performance of the proposed system is evaluated using the NSL-KDD and UNR-IDD datasets, and the experiment results show that it performs better han baselines and has the potential to be used in modern NIDS.

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A STUDY ON DETECTION OF FAKE REVIEW USING MACHINE LEARNING MODELS

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Abstract

The problem of fake news has become one of the most complicated issues facing society. Nowadays, via social media, false information will spread easily. In this respect, fake news needs to be identified as soon as possible to prevent adverse effects on individuals who may rely on such knowledge when making important decisions (e.g., presidential elections). In this post, we present a groundbreaking approach that utilizes machine learning methods for fake news detection. Our studies show that the proposed approach like Random forest and KNN are used for correct result classification, such an algorithm remains passive and when there is a miscalculation, it becomes active, updating and adjusting. The aim is to make changes that correct the error, making very little changes to the outcomes and enables us to achieve promising outcomes. As per the studies and test performed the accuracy of this solution is about 96%.

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AI–POWERED DETECTION OF CANCER CELL AND THEIR STAGES USING ZEBRA MEDICAL VISION TOOL

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Abstract

The early detection and accurate staging of cancer remain critical challenges in modern healthcare, where timely diagnosis can significantly influence treatment decisions and patient outcomes. This study investigates the use of Zebra Medical Vision, an advanced artificial intelligence (AI)-driven imaging analytics platform, in the detection and staging of cancer cells through the analysis of medical imaging data. Zebra Medical Vision leverages deep learning models trained on millions of annotated radiological images, including CT scans, MRIs, and mammograms, to autonomously detect abnormalities associated with various cancer types such as lung, breast, liver, and colorectal cancers. Through integration with radiology workflow systems, Zebra Medical Vision enhances diagnostic speed and accuracy while reducing inter-observer variability among radiologists.

This research examines the clinical performance metrics of Zebra Medical Vision's algorithms, including sensitivity, specificity, precision, recall, and AUC (Area Under the Curve) for cancer detection and staging. Case studies and retrospective analyses highlight the platform's utility in supporting early intervention, risk stratification, and personalized treatment planning. The results demonstrate that Zebra Medical Vision not only accelerates diagnostic processes but also improves the consistency of cancer staging, which is essential for therapy planning and prognostic assessment.

In conclusion, the incorporation of Zebra Medical Vision's AI technology into diagnostic radiology represents a significant advancement in AI-powered precision oncology, offering scalable and reliable solutions for early cancer detection and staging. This study underscores the potential of AI to augment clinical expertise, reduce diagnostic errors, and contribute to more efficient and equitable healthcare delivery.

Keywords: AI-power cancer detection, zebra medical vision, TNM staging automation, Deep learning in oncology, Radiomics analysis.

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AI GUIDED BIO PRINTED MULTI-ORGAN ON CHIP WITH REAL TIME DRUG TESTING AND TISSUE MONITORING

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Abstract

Artificial intelligence (AI), 3D bioprinting, and organ-on-chip (OoC) technology are Transforming biomedical research by enabling real-time drug testing and tissue monitoring. Traditional methods often fail to predict human responses accurately, but AI-driven Bio printed OoC systems create patient-specific tissue models that better mimic human Physiology. AI models like AutoML optimize bioink formulations, while DeepLabCut tracks Cellular morphology. Microfluidic systems simulate blood circulation, ensuring realistic biological modeling. Generative Adversarial Networks (GANs) predict drug efficacy and reinforcement learning refines screening conditions for enhanced accuracy. CNNs and Autum Vision analyze imaging data for tissue monitoring while LSTMs predict cellular Responses over time. For personalized medicine AI interprets patient genetic data to Customize treatments. BERT processes complex biomedical data while Federated Learning enables secure, collaborative AI model training. Explainable AI (XAI) ensures Transparency aiding regulatory acceptance. Challenges remain in standardization, regulatory approval, and computational demands But Edge AI and high-performance computing offer real-time processing solutions. Future advancements include AI-powered digital twins and Physics-Informed Neural Networks (PINNs) for in silico drug testing, reducing experimental costs and improving Precision medicine. AI driven bioprintedOoC platforms revolutionize drug discovery, disease modeling, Personalized medicine and accelerating research. As AI evolves Physics-Informed organ models will redefine Healthcare and pharmaceutical development.

Keywords: Collaborative AI Model, 3D Bioprinting, Organ-on-Chip, GAN, Personalized Medicine, Drug Discovery, LSTMs, Explainable AI (XAI), BERT.

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DUAL DRUG DES – BASED TRANSDERMAL SYSTEM FOR CHRONIC DISEASE MANAGEMENT

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Abstract

Chronic diseases such as diabetes, arthritis, and cardiovascular disorders continue to be leading causes of morbidity and mortality worldwide. The limitations of conventional drug delivery methods, including poor bioavailability, systemic side effects, and reduced patient compliance, have prompted the exploration of innovative therapeutic platforms. Dual Deep Eutectic Solvents(DES), formed by the combination of two distinct hydrogen bond donors and acceptors, have emerged as promising carriers in transdermal drug delivery systems(TDDS). These solvents offer advantages such as enhanced solubility of poorly water-soluble drugs, improved skin permeation, low toxicity, and biocompatibility.

The dual DES approach allows for the co-solubilisation of multiple therapeutic agents or the tailoring of solvent properties to target specific drug delivery challenges in chronic disease treatment. When incorporated into TDDS, these solvents can facilitate controlled and sustained drug release, reduce the frequency of dosing, and potentially minimize systemic adverse effects. This abstract highlights the current advancements, formulation strategies, mechanistic insights, and therapeutic potential of dual DES in transdermal delivery for chronic disease management. Furthermore, it discusses the challenges related to formulation stability, skin irritation, and regulatory considerations.

Keywords: Dual Deep Eutectic Solvents, Transdermal Drug Delivery System, Chronic Disease Management

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COMPUTER -AIDED DIAGNOSIS OF LUNG CANCER SUBTYPES USING CONVOLUTIONAL NEURAL NETWORK

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Abstract

Lung cancer (LC) continues to be a major global health challenge, primarily due to its high death rates and the complexity of its various subtypes. Analyzing histopathological images is essential for accurately diagnosing these subtypes, but the traditional manual interpretation can be both slow and subjective. To tackle these issues, this study introduces a computer-aided diagnosis system that employs Convolutional Neural Networks (CNNs) for the automatic classification of LC subtypes, which include adenocarcinoma (ADC), squamous cell carcinoma (LUSC), and the less common adenosquamous carcinoma (ASC). CNNs are particularly effective because they can automatically identify and extract important features from image data without the need for manual feature engineering. The model is trained and validated using histopathological images and assessed with standard metrics like accuracy, sensitivity, and the area under the receiver operating characteristic (ROC) curve. The experimental findings show that the CNN-based method surpasses traditional machine learning models, providing better accuracy and generalization when distinguishing between LC subtypes. This progress not only boosts diagnostic efficiency but also supports clinicians in developing more tailored treatment strategies.

Keywords: Lung cancer, Convolutional Neural Network, histopathology, deep learning, subtype classification

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GENERAL X-RAY IMAGE ENHANCEMENT USING CLASSICAL AND FREQUENCY-DOMAIN TECHNIQUES: A PREPROCESSING PERSPECTIVE FOR MEDICAL IMAGING

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Abstract

Medical X-ray imaging clinical diagnostics remains an essential tool, widely employed in detecting and evaluation of various conditions such as bone fractures, pulmonary disorders, and dental anomalies. Despite its important role, the clinical utility of X-ray images is often interrupted by the boundaries inherent, including low contrast, noise intervention and inadequate visibility of physical structures. These issues can arise due to the condition of suboptimal acquisition, such as improper risk, latitude of equipment or patient movement. Consequently, preposing of X-ray images through enhancement techniques becomes mandatory to improve their visual clarity and clinical reliability.

This letter presents a comprehensive assessment of classical and frequency-domain image enlargement methods aimed at improving the quality of general-purpose X-ray images. In particular, it examines three major techniques- UNSHARP MASKING (UM), High-European Emphasis Filtering (HEF), and Contrast Limited Adaptive Histogram Else (Clahe). Each of these methods increases images through different mechanisms: Um emphasizes the edges by strengthening high-existence details; HeF increases high-existing components in the frequency domain while maintaining overall realism; And the Clahe increases the opposite in local areas by recurring intensity values within defined boundaries.

The study uses publicly available datasets-which include NIH Chestax-Ray 14, Mura and Dental Radiograph to evaluate the performance of each technology. Standard preposing involves converting all images into grancale and equally shaped them to 640 × 480 pixels. To ensure fairness in evaluation, lightness order error (LOE) metric is used to assess the naturality of enhanced image.

Keywords; X-ray image, Unsharp Masking (UM), High-Frequency Emphasis Filtering (HEF), Medical Image Preprocessing

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DEVELOPMENT OF AN AI-BASED INVASIVE BRAIN-COMPUTER INTERFACE CHIP FOR NEUROLOGICAL ENHANCEMENT

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Abstract

The increasing prevalence of neurological disorders and the rising demand for cognitive enhancement technologies have driven significant advancements in Brain-Computer Interface (BCI) systems. This paper presents the design, development, and applications of an AI-based invasive Brain-Computer Interface (BCI) chip engineered for neurological augmentation and therapeutic intervention. By integrating artificial intelligence (AI) with advanced neuromodulation techniques, the chip establishes a bidirectional communication pathway between the brain and external computing systems, enabling real-time neural signal decoding and stimulation. The proposed BCI chip utilizes a novel neural signal processing architecture powered by machine learning algorithms to interpret and respond to brain activity with high precision. Its high-density microelectrode array, combined with AI-driven signal processing, allows for the detection, amplification, and decoding of neural patterns associated with cognitive functions and neurological dysfunctions.

This capability facilitates personalized neuromodulation, offering potential treatments for neurodegenerative diseases such as Alzheimer's, Parkinson's, epilepsy, and traumatic brain injuries, while also supporting cognitive enhancement in healthy individuals. Additionally, its ultra-thin, flexible electrodes minimize tissue damage while maintaining high signal fidelity, enabling long-term implantation with reduced immune response. This work represents a significant leap in neurotechnology, merging AI-driven medical devices with next-generation brain augmentation tools. These findings in both clinical and non-clinical settings, paving the way for a future where neurological disorders are effectively managed and cognitive capabilities are enhanced.

Keywords: Brain-Computer Interface (BCI), Artificial Intelligence (AI), Neuromodulation, Neural Implants, Cognitive Enhancement, Neurodegenerative Diseases

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CLOSED LOOP PAIN MANAGEMENT FOR CHRONIC PAIN RELIEF

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Abstract

Chronic pain remains an important global health issue, which affects millions of individuals and puts sufficient burden on health care systems. Spinal Cord Stimulation (SCS) has emerged as a non-pharmacological alternative to the management of chronic neuropathic and musculoskeletal pain. However, traditional open-loop SCS devices work with fixed stimulation parameters, disregarding real-time changes in the patient's physical condition. This limit is often required inadequate pain control, manual adjustment and unwanted side effects. Closed-loop pain management system (CLPMS) represents a paradigm change in neuro stimulation therapy, offering adaptive, patient-specific treatment by adjusting frequent stimulation based on physical reaction. These smart neuro stimulators monitor the results made to optimize the results to optimize stimulation in real time. The inclusion of sensing and stimulating electrodes in an integrated architecture reduces complexity and improves the reliability of long -term implantation. Advanced control algorithms, proportional-renovated (PID) controllers, model forecasting control (MPC), and machine learning techniques, enable dynamic adjustments to maintain medical efficacy to prevent overstimulation and tissue damage.

Strong wireless telemetry systems facilitate real-time monitoring, firmware updates and emergency intervention, while energy-skilled power management expands the device lifetime through rechargeable battery or energy harvesting methods. Despite its promises, CLPMs face important challenges, including accurate, deformation evidence-free response signal recording, ensuring long-term stability of the biomarker, designing safe algorithms yet, adaptive algorithms and meeting tightly regulatory standards. In addition, technical complexity and high initial costs presents obstacles to widely adopt. Nevertheless, benefits - such as individual medical treatment, improvement in pain relief, reduction in side effects, increase in patient autonomy, and prolonged devices advocate for longevity - their development and integration in clinical practice. Multi-modal biomarkers are expected to further enhance the capabilities of CLPM from natural connectivity, modelling of pain

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dynamics, and spontaneous connectivity with wearable health devices. Longitudinal clinical studies are necessary to validate their efficacy and safety in diverse patient population. Closed-loop neuro stimulation represents a significant leap towards intelligent, responsible and patient-centred pain management solutions, promising to reopen the old pain therapy landscape.

Keywords: Closed loop system, Pain control, chronic pain, Spinal cord, Smart transplantation, Body signal (biomarker), Adaptive stimulation, Wireless communication, Battery and power management, Personal treatment.

INDEX AND ENGINEERING PROPERTIES OF SOILS: A CASE STUDY IN JINKA CITY, ETHIOPIA

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Abstract

Understanding soil properties is essential for the safe design and construction of civil engineering structures. This study aims to assess the index and engineering properties of soils in Jinka City, Ethiopia. The scope covers twelve test pits selected based on urban expansion areas and existing infrastructure, as identified by the Jinka Municipality. Twenty-four soil samples were manually excavated from 1.5 and 3 m depths, and both field and laboratory tests were conducted. Field tests included natural moisture content and field density. Laboratory tests covered grain size distribution, Atterberg limits, specific gravity, unconfined compressive strength, direct shear, and consolidation tests. Results revealed that soils in the area are mostly fine-grained (cohesive). Natural moisture content ranged from 24.5% to 37.31%, and bulk density from 1.64 to 1.93 g/cm³. Liquid limits varied between 25.85% and 69.62%, and plasticity index between 3.43% and 41.45%. Soils exhibited free swell values of 15% to 40% and specific gravity between 2.63 and 2.72. Unconfined compressive strength ranged from 49 to 230.27 kN/m², with shear strength parameters (cohesion and friction angle) ranging from 17–23 kN/m² and 36.9°–41°, respectively. Clay activity ranged from 0.15 to 0.58. Consolidation test results showed compression indices of 0.249–0.343 m²/kN. The soils were classified as CH, SC, and SM under USCS, and A-7-6, A-4, and A-2-6 under

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AASHTO. The findings are significant for guiding safe foundation design and urban development planning in Jinka City.

Keywords: Atterberg limits, Physical properties, Compression Index, and shear strength

ENGINEERING BEHAVIOR OF RESIDUAL TROPICAL SOILS OF KONSO TOWN, ETHIOPIA

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Abstract

Understanding the behavior of subsoil is essential for the safe and economical design of civil engineering structures. This study was carried out to assess the engineering and index properties of soils in Konso town, a region experiencing rapid urban expansion. The primary aim of this research was to determine the geotechnical characteristics of local soils that influence construction and land development. The specific objectives were to classify the soil, evaluate its physical and mechanical behavior, and determine its suitability for structural foundations. The study focused on soils within the core and peripheral areas of Konso town, selected based on current settlement patterns and planned urban expansion. The significance lies in providing baseline geotechnical data for engineers, planners, and decision-makers engaged in infrastructure development. Methodologically, ten test pits were manually excavated at different depths. Field tests included natural moisture content and in-situ density measurements. Laboratory tests encompassed grain size analysis, Atterberg limits and shear strength. Results indicated that the dominant soil type is silty clay (MH) with low activity (activity number < 0.75), suggesting minimal swelling behavior. Moisture content ranged from 13–45%, plasticity index from 18.05–25.21%, and clay fraction from 33–57.6%. Specific gravity varied between 2.58 and 2.8. Free swell values were between 10–38%. Shear strength parameters (c, ϕ) ranged from 148.21–186.11 kPa and 8°–11°, while unconfined compressive strength ranged from 234–321 kPa.

Keywords: Konso, Index Properties, Shear strength

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SUSTAINABLE CONCRETE PAVER BLOCK PRODUCTION USING WASTE CERAMIC TILES AS AGGREGATE SUBSTITUTES

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Abstract

The usage of ceramic materials, such as electrical insulators, sanitary fittings, and tiles, in new building is rapidly expanding. However, a large portion of these materials are lost during manufacturing, transportation, and placement due to their fragile character. In addition to improving the qualities of concrete, using these ceramic wastes as raw materials for concrete manufacturing is an excellent way to support environmental sustainability. Utilizing leftover tiles in the building sector improves urban waste management and lessens the need for excessive aggregate quarrying. The feasibility of using leftover ceramic tiles in concrete is investigated in this experimental study. Ceramic tile aggregates were used as partial replacements for coarse aggregates at replacement levels of 0%, 10%, 20%, 30%, and 40% once their physical properties were established. The results demonstrate that, in comparison to natural aggregates, ceramic tile aggregates have a lower specific gravity and a higher capacity to absorb water. The mixtures with the highest compressive and split tensile strengths were those with a 30% replacement. According to the findings, ceramic waste may be effectively turned into paving blocks, which can support ecologically friendly and sustainable pavement infrastructure.

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EXPERIMENTAL INVESTIGATION IN CONCRETE WITH ADDITION OF BASALT ROCK FIBER

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Abstract

This study investigates the effects of incorporating basalt rock fibers into concrete on its mechanical properties and durability. By introducing basalt fibers in varying proportions (0%, 0.25%, 0.5%, 0.75%, and 1% by volume), the research aimed to determine their impact on compressive and tensile strength over a 28-day curing period. The results demonstrated a significant enhancement in mechanical properties, with strength increasing as fiber content rose, reinforcing the concrete matrix against compression and tension. Additionally, the durability of the concrete improved, as indicated by reduced water absorption and lower porosity, which enhance resistance to environmental factors such as freeze-thaw cycles and chemical exposure. The study identified 0.75% basalt fiber content as the optimal dosage, maximizing both strength and durability. However, exceeding this proportion led to reduced workability, making the concrete harder to mix and pour. This highlights a practical limitation in the application of basalt fibers. Despite this, the findings suggest that basalt rock fibers offer a sustainable alternative to synthetic or steel reinforcements, contributing to the development of stronger, more durable, and eco-friendly concrete structures.

Keywords: Basalt rock fibers, Mechanical properties, Water absorption, Porosity.

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EXPERIMENTAL INVESTIGATION OF MECHANICAL AND DURABILITY PROPERTIES OF MOLLUSC SHELL CEMENT COMPOSITES

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Abstract

The primary problem with cement usage is its significant environment impact, mainly due to the high carbon emission generated during its production. This experimental investigation studied the mechanical and durability properties of cement composites reinforced with Mullosc shell, comparing them to traditional mortar mixes with ratio of 1:3 and 1:5(cement : sand). Mullosc shell with their high calcium content, were used as an alternative reinforcement material. The study involved preparing cement composites with varying proportions (0%, 5%, 10% and 15%) of Mullosc shell by weight of cement. These composites were then tested at 7, 14 & 28 days for their compressive strength, water absorption and Sorptivity were then tested at 28days and compared to conventional mortar mixes. The findings suggest that Mullosc shell can be an eco-friendly, suitable, effective and sustainable material for enhancing the mechanical and durability properties of cement composites.

Keywords: Mollusc shell powder, Cement, Compressive strength, water absorption, Sorptivity.

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EXPERIMENTAL INVESTIGATION ON STEEL FIBER REINFORCED CONCRETE WITH GGBS

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Abstract

Concrete is the mostly used construction material in the world. Concrete is strong in compression but weak in tension which results in brittle failure of concrete. Recent years' enormous work is executed by incorporating urban waste in building materials. The use of admixtures in concrete enhances the performance of concrete. The most common mineral admixtures used are fly ash, silica fume, GGBS, rice husk ash, etc. These admixtures possess pozzolanic properties and mostly used as are placement of cement. In addition to the admixtures, different types of fibers can be used to enhance the tensile strength, ductility and toughness of concrete. An attempt has been initiated to study the properties of concrete by incorporating the potential utilization of GGBS as a partial replacement of cement and addition of 1% of corrugated steel fibers. Ordinary Portland cement of 53grade conforming to IS12269:2013 was used. River sand free from debris and good gravel were used as fine aggregate and coarse aggregate conforming to IS 383: 2016. Mix design for M20 grade of concrete was done as per IS10262-2009.Cement is replaced with 0%,25%, 50%, 75% and 100% of GGBS with an addition of 1% corrugated steel fibers with an aspect ratio of 60. Compressive strength, Split tensile strength and acid resistance test was conducted. The experimental result with GGBS and Steel fiber were compared with normal cement concrete. It was found that the optimum replacement of cement with GGBS was found to be 50% which increased with addition of 1% corrugated steel fibers. It was noticed that corrugated steel fibers reduced the cracks propagation.

Keywords: GGBS, Crippled Steel Fibers, Compressive Strength, Split Tensile Strength, Impact Strength, Acid Durability

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RETROFITTING OF DETERIORATED COLUMN USING GRAPHENE OXIDE CEMENT COMPOSITE

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Abstract

This article examines the visible cracks and the current status of crack development in the structure and identifies areas that require improvement. Non-destructive tests, such as the Rebound Hammer test and Ultrasonic Pulse Velocity test, provide information on the strength and depth of cracks without causing any damage. The repair process is conducted by utilizing a cement composite that incorporates Graphene Oxide. Concrete is the primary construction material that is widely utilized for numerous construction projects. Concrete typically gives rise to a multitude of issues that a civil engineer can address. Civil Engineering encompasses the planning, creation, and upkeep of diverse structures. In addition to necessitating routine maintenance, numerous structures necessitate substantial repair, rehabilitation, or retrofitting. Over time, as these structures age, we observe a decline or deterioration in them, which is evident through various signs such as cracking, splitting, delamination, and corrosion of the reinforcing. These degraded structures can be restored and strengthened by employing different varieties of cement, admixtures, and contemporary repair materials.

This article examines the visible cracks and the current status of crack development in the structure, and identifies areas that require improvement. The cement composite is prepared with various proportions of Graphene oxide, viz., 0%, 1%, 2%, 3%, and 4%, respectively, with a variance of 1% with the weight of cement. For identifying the optimum content of cement replacement with graphene for retrofitting, the preliminary tests, viz., Initial and final setting times, Consistency to know the water content, and compressive strength. After that, the Non-Destructive Tests (NDT), such as the Rebound Hammer test and Ultrasonic Pulse Velocity test, provide information on the strength and depth of cracks without causing any damage. The repair process uses a cement composite that incorporates Graphene Oxide of about 3% in place of cement. The Graphene Oxide demonstrates favourable outcomes and exhibits commendable compressive strength increment of 37% and

sealing capability. The corroded column underwent repair, and the resultant values were compared with those before and after the repair/rehabilitation operation.

Keywords: Cracks; Rehabilitation; Deteriorations; Cement Composites; Initial and Final Setting Times; Consistency; Compressive Strength; Optimum content; Non-Destructive Tests; Graphene Oxide; Rebound Hammer; Ultrasonic Pulse Velocity.

PLANNING, ANALYSIS AND DESIGN OF MULTISTORY INSTITUTIONAL BUILDING (G+5) USING AUTO CAD AND STAAD.Pro

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Abstract

The planning, analysis, and design of a multi-storey Institutional building (G+5) using Auto CAD and STAAD.Pro software are presented in this article in a comprehensive manner. The study focuses on using the load limit state method throughout the design phase to guarantee structural integrity and safety. The building structure may be efficiently modeled, analyzed, and visualized to the combination of Auto CAD and STAAD.Pro. The focus is on assessing bending moment distributions and shear strength in order to determine the performance and stability of the structure under different loading scenarios. The study emphasizes the value of sophisticated computational tools in optimizing the design process and improving the precision and dependability of buildings with several stories. This study advances building design techniques by providing insights into the best structural solutions through a methodical approach.

Keywords: Multi storey institutional Building, G+5, Auto CAD, STAAD.Pro, Planning, Analysis, Design, Load Limit State Method, Shear Strength, Bending Moment, Structural Engineering.

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INVESTIGATION ON CONCRETE WITH REPLACEMENT OF POTABLE WATER WITH DYE WATER FOR ENHANCING THE ENVIRONMENT AND ECO-FRIENDLY CONCRETE

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Abstract

The demand for multi-functioning concrete is rising to meet the advanced structural challenges. Most of the prior toughening techniques centered on using various reinforcing elements to increase the cement composites' brittleness and flexural strength. These cement composites show an excessive compressive strength but, still exhibit brittleness properties with less flexural strength. In general, water is used to produce the concrete. However, this concrete production takes 18% of water, which is the total weight of concrete. And also, the water is getting wasted for various purposes like industries, and dying of clothes. In this present work, the water that is used for dying purposes has been used in place of normal water with a variance of 5% with a p^H of 6.8. The proportions of water are, 0%, 5%, 10%, 15%, 20 %, 25%, and 30 %. The properties of concrete with and without the replacement of water have been analyzed by conducting the compressive strength, and split tensile strength of mechanical properties. The compressive strength was observed 25 % increment for the 25 % replacement of water with the nominal mixture. The brittle property is also been reduced with the nominal percentages. From the results, it is evident that the dying water can also be used in constructions on a small scale whereas on a larger scale, it should require the proper filtration to remove hardness from water.

Keywords: Concrete; Water; Dye Water; Compressive Strength; Split Tensile Strength; Flexural Strength; p^H; XRD; SEM-EDS;

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INVESTIGATION OF MECHANICAL AND DURABILITY PROPERTIES OF PALM KERNEL SHELL POWDER CEMENT COMPOSITE

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Abstract

A large amount of carbon dioxide is released during the cement-making process, which degrades the environment. Alternative materials are being investigated for sustainable construction as a solution to this problem. Palm Kernel Shell Powder (PKSP) is used in this study at replacement levels of 5%, 10%, 15%, and 20% to examine the structural behavior of concrete. Assessing the mechanical and durability characteristics of PKSP-replaced concrete in comparison to PKSA-replaced concrete, including workability, durability, compressive strength, and split tensile strength, is the main goal. To evaluate the growth of strength over time, concrete cubes and cylinders will undergo testing at 7, 14, and 28 days of curing. The goal of the study is to identify the ideal PKSP replacement amount that balances environmental sustainability with improved concrete performance. The results of this investigation finding the ideal PKSP replacement level to improve concrete performance and support environmental sustainability is the goal of the study. The research's conclusions may help lessen reliance on cement, cut carbon emissions, and promote the use of agro-waste materials in building projects.

Keywords: Palm Kernel Shell Powder (PKSP), Palm Kernel Shell Ash (PKSA), Compressive Strength, Workability, Durability, Eco-Friendly Construction

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INTEGRATED PLANNING AND STRUCTURAL DESIGN OF A STILT + G+2 RESIDENTIAL BUILDING USING AUTOCAD AND STAAD.Pro

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Abstract

The integrated planning and structural design of a Stilt + G+2 residential structure utilizing AutoCAD and STAAD.Pro is the main goal of this project. While structural design adheres to Indian Standards such as IS 456:2000, IS 875, and IS 1893, architectural planning is carried out in accordance with functional and spatial needs. The limit state design approach is used to examine the building's dead, live, wind, and seismic loads. Incorporating shear walls improves lateral stability, and using the right materials and planning helps to ensure fire safety. Grid slabs are intended for open spaces such as auditoriums and seminar rooms. STAAD.Pro manages the structural analysis of beams, columns, slabs, and footings, while AutoCAD is utilized for planning and details. The project demonstrates how well contemporary tools may be used to guarantee safe, cost-effective, and code-compliant building design.

Keywords: Stilt Floor; Residential Building; Structural Design; AutoCAD; STAAD.Pro; Shear Wall; Grid Slab; Limit State Method; Seismic Load; Fire Safety; IS 456:2000; IS 875, IS 1893.

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EXPERIMENTAL STUDY ON THE USE OF NATURAL COAGULANTS FOR SURFACE WATER TREATMENT

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Abstract

This study investigated the potential of natural coagulants, namely Moringa oleifera seed powder (MOSP), banana peel powder (BPP), and watermelon seed powder (WSP), to improve surface water quality. Surface water samples were collected from the Buckingham Canal in Sangam Jagarlamudi, Andhra Pradesh, India, and treated with varying dosages of natural coagulants. The efficacy of the coagulants was evaluated based on their ability to reduce the pH, turbidity, chemical oxygen demand (COD), and biochemical oxygen demand (BOD). MOSP exhibited the highest coagulation activity at a dosage of 0.5 g/500 ml, achieving 98% turbidity reduction, 75.25% chemical oxygen demand (COD) removal, and 81% biochemical oxygen demand (BOD) removal. This superior performance is attributed to the cationic proteins in MOSP, which act as excellent coagulants and have antimicrobial properties. BPP and WSP showed moderate performance, with 95% and 81% turbidity reduction, 59.25% and 67% COD removal, and 67% and 74% BOD removal, respectively, at the same dosage. The polysaccharides in BPP and protein-lipid complexes in WSP are believed to be responsible for their coagulation abilities. This study highlights the importance of pH optimization for enhanced coagulation efficiency and the risks associated with overdosing. These findings suggest that natural coagulants, particularly MOSP, have the potential to be sustainable alternatives for water treatment. Further research on pH-dose synergy, hybrid systems, and real-water trials is recommended to bridge efficacy gaps and optimize performance.

Keywords: Natural coagulants, moringa oleifera seed powder, banana peel powder, watermelon seed powder, turbidity reduction, chemical oxygen demand, biochemical oxygen demand, surface water quality.

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INVESTIGATING THE MECHANICAL PROPERTIES OF CONCRETE WITH PARTIAL SUBSTITUTION OF COARSE AGGREGATE BY RECYCLED PLASTIC AGGREGATES

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Abstract

Concrete is versatile building material used for construction. Now days the use of plastic is increasing day by day, although steps were taken to reduce its consumption. The problem of disposing and managing of plastic waste materials in all countries has become one of the major environmental, economical and social issues. This creates substantial garbage every day which is much unhealthy. In order to reduce these plastic waste we will use in civil construction for light weight structures. Also, the cost of building materials used in concrete is increasing day by day. To overcome this situation, recycled plastic aggregates can be used as aggregates instead of natural aggregates. In this project, an attempt has been taken to experimentally study the durability of concrete with partial replacement of coarse aggregate with recycled plastic aggregates. In this project is aimed at concrete mix with partial replacement of coarse aggregate by Recycled plastic aggregates (RPA) with 0%, 20%, 40%, and 60% that will provide an advantage in reducing the dead weight of structures. In this study M40 grade of concrete is used and the mix design is done as per IS 10262:2009. From the test results it was found that 20% replacement of natural coarse aggregate with recycled plastic aggregates gave optimum values. Hence in this project, 20% of natural coarse aggregate is replaced with recycled plastic aggregates. The concrete cubes of size 150mmX150mmX150mm and cylinders of size 150mm diameter and 300mm height are casted for conventional concrete (CC). The main purpose of this project is to evaluate the possibility of using granulated recycled plastic aggregates to partially substitute for the coarse aggregate in concrete composites. Also to construct a light weight concrete structure with recycled plastic aggregates.

Keywords: Recycled Plastic Aggregates, Compressive strength, split tensile strength, Cement, Fine Aggregates, Coarse Aggregates, Water and Conventional Concrete.

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EXPERIMENTAL STUDIES ON IMPACT STRENGTH OF CONCRETE WITH NANO –FLYASH

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Abstract

This paper deals with the study of nano-materials in concrete. The use of nano-material in concrete is of recently origin. The fly- ash from power plants stations are mainly used for the construction building materials. In this work fly ash is used as a replacement of coarse aggregate and mix proportioning is done as per Indian standard methods according to IS 10262-2009 for M20, M30, M40, M50 grade of concrete is replaced by 10%, 20%, 30%, 40%, 50% of Nano-Fly ash each grade of concrete. In this experimental study the specimens are tested and compared for impact strength. To study the particle size SEM, EDAX are used.

Keywords: Impact Strength, Nano-Fly ash

EXPERIMENTAL INVESTIGATION OF NANO MATERIALS IN CONCRETE

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Abstract

This report work deals with the use of nano-materials in concrete. The use of nano materials in concrete is of recent origin. An attempt has been made to understand the behavior of concrete with nano materials and to compare its performance with that of Normal Cement Concrete. Mix design ratios calculated and designed in Indian, American and British Standard Methods for M20, M30, M40 and M50 grades of concrete. Replacement of coarse aggregates with nano-fly-ash has been tried during this study; the casting of cubes and cylinders has been done for each grade of Normal Cement Concrete. In the case of concrete

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with nano-materials replacement of coarse aggregates in 10%, 20% and 30% of nano-flyash respectively. The slump and compaction factor values have been found out for different mixes simultaneously. The experimental investigations such as compressive strength of cubes, the modulus of elasticity of the cylinder and the tensile strength of cylinder have been found out for each grade and compared with Normal Cement Concrete.

Keywords: Normal Cement Concrete, nano-materials nano-flyash, compressive strength, Tensile strength, modulus of elasticity

SEISMIC RETROFITTING OF REINFORCED CONCRETE BUILDINGS USING TRADITIONAL AND INNOVATIVE TECHNIQUES

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Abstract

The seismic retrofitting of reinforced concrete buildings not designed to withstand seismic action is considered. After briefly introducing how seismic action is described for design purposes, methods for assessing the seismic vulnerability of existing buildings are presented. The traditional methods of seismic retrofitting are reviewed and their weak points are identified. Modern methods and philosophies of seismic retrofitting, including base isolation and energy dissipation devices, are reviewed. The presentation is illustrated by case studies of actual buildings where traditional and innovative retrofitting methods have been applied.

Keywords: Energy dissipation devices, Seismic Vulnerability, Seismic Retrofitting, Base Isolation

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INFLUENCE OF NANO FLY ASH ON BEHAVIOUR OF BOND IN BRICK MASONRY

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Abstract

Nanotechnology has changed our vision, expectations and abilities to control the material world. The developments in nano-science can also have a great impact on the field of construction materials. Portland cement, one of the largest commodities consumed by mankind, is obviously the product with great, but not completely explored potential. Better understanding and engineering of complex structure of cement based materials at nano-level will definitely result in a new generation of concrete, stronger and more durable, with desired stress-strain behavior and, possibly, with the whole range of newly introduced "smart" properties. It has been found that physical properties of concrete, particularly strength and permeability significantly depend on its pore structure. This report work deals with the use of nano-materials in cement mortar to study the behavior of bond in brick masonry. The use of nano materials in cement mortar is of recent origin. In this report a detailed survey of literature based on brick masonry, M sand and nano-flyash is done. Also the mortar ratio used was 1:2, 1:3 and 1:4. The experimental investigation on materials used is found experimentally. The fly ash is converted to nano size using ball grinding mill and the size is checked by the image produced by scanning electron microscope. An attempt has been made to understand the behaviour of brick masonry prism with replacement of cement by nano flyash in cement mortar. Experiments were conducted on compressive strength and shear bond of brick masonry by using river sand and M sand as fine aggregate. During this period, the casting of brick masonry of size 200mmx300mmx300mm for compressive strength and 200mm x 100mm for shear bond has been done for each ratio of cement mortar. The result was obtained and its behaviour was studied.

Keywords: Nanotechnology, river sand, M sand, nano fly ash, brick masonry, compressive strength

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INVESTIGATION ON MECHANICAL AND DURABILITY PROPERTIES OF FIBRE REINFORCED FOAM CONCRETE

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Abstract

The investigation of foam concrete by incorporating natural admixtures aims to enhance its properties while promoting sustainability in construction materials. Foam concrete is a lightweight, versatile material known for its excellent thermal insulation, soundproofing, and reduced weight, making it an ideal choice for various structural and non-structural applications. However, its mechanical properties, such as strength and durability, can be limiting factors for certain uses. This study explores the effect of adding natural admixtures, such as plant-based fibers, natural polymers, or waste materials, on the performance of foam concrete. This research focuses on the investigation and experimental analysis on the physical characteristics of lightweight foamed concrete (LFC) incorporating coconut fibers composites with different volume percentage of fibers 0.25, 0.5, 0.75 and 1. LFC is produced by cement paste or mortar in which air voids are entrapped in the mortar by the suitable foaming agent. The results of the test showed that the both of physical properties of the concrete increases with curing age and quantity of coconut fiber.

Keywords: foam concrete, coconut fiber, natural admixtures, lightweight foamed concrete.

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EXPERIMENTAL INVESTIGATION ON THE MECHANICAL PROPERTIES OF SELF CURING HIGH PERFORMANCE CONCRETE USING POLYVINYL ALCOHOL AND RECYCLED GLASS POWDER

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Abstract

Self-curing high-performance concrete (SCHPC) is an innovative solution for Enhancing durability and sustainability in construction. This experimental study investigates the mechanical properties of SCHPC Incorporating polyvinyl alcohol (PVA) as a self-curing agent and recycled glass Powder (RGP) as a partial cement replacement. The research evaluates the compressive strength, tensile strength, and flexural Strength of different mix proportions with varying percentages of RGP and PVA. The self-curing effect of PVA improves internal moisture retention, reducing autogenously shrinkage and enhancing hydration. Meanwhile, the pozzolanic properties of RGP contribute to improved strength and Durability.

Keywords —Self-curing High Performance Concrete (SCHPC), Polyvinyl Alcohol (PVA), Recycled Glass Powder, Compression Strength, Sustainability in Construction

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IDENTIFICATION OF GROUNDWATER POTENTIAL ZONES USING MORPHOMETRIC PARAMETERS OF UPPER PONNAIYAR BASIN, SOUTH INDIA

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Abstract

Groundwater investigation by morphometric analysis with the use of Remote Sensing (RS) and Geographical Information System (GIS) is one of the most efficient and cost-effective methods. The aim of the study is to evaluate the groundwater potential using morphometric data of the Upper Ponnaiyar Basin. The sub-basin was analyzed to measure basic morphometric attributes such as stream length, stream order, basin length and area, and basin perimeter. These basic attribute values were fed into formulas of corresponding morphometric attributes including drainage density, stream frequency, stream length ratio, mean stream length, form factor, circularity index, elongation ratio, length of overland flow, stream frequency, drainage density, drainage texture and infiltration number.

SRTM data were also used to extract elevation information which was used as a base to derive other relief aspects of the watershed including ruggedness index, dissection index, relative/basin relief, relief ratio, and slope. Totally, 11 variables including geology were used to generate thematic layers which include feature classes and assigned values ranging from 1 to 8 on the basis of their influence on groundwater occurrence. All these thematic maps were integrated by Weighted Overlay Module to generate groundwater potential map as an output. The potential map generated by weighted overlay analysis shows domination of moderate groundwater potential zones. From the present work, it is proved that the potential zone map can be a guide to select target areas and carry out geophysical investigation in order to successfully find out the depth of the groundwater aquifers.

Keywords: Morphometric analysis, Ponnaiyar basin, Groundwater investigation, Weighted Overlay Analysis, Groundwater potential zone mapping

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INVESTIGATION OF WASTE WATER CHARACTERISTICS IN THE KELAVARAPELLI RESERVOIR REGION: AN EXPERIMENTAL APPROACH

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Abstract

Due to the growing pollution from home, industrial, and agricultural sources, wastewater treatment in river water is a serious environmental concern. Untreated wastewater flows into rivers can destroy aquatic life, deteriorate water quality, and endanger human health. By assessing their physical, chemical, and biological characters from five different sample locations, this study investigates several wastewater treatment suggestions aimed at improving river water quality in and around the Kelavarapelli Dam region. The collected wastewater physical and chemical properties, including its pH, turbidity, electrical conductivity, TDS, BOD, COD, heavy metals, and microbiological characteristics, are identified. Permissible standards are compared with the tested levels. A suitable treatment approach is recommended based on the result value. The removal efficiency of contaminants such heavy metals, organic pollutants, nutrients, and pathogens is used to evaluate how effective various techniques are. Furthermore, by using a trial-and-error approach, the integration of advanced treatment technologies such as membrane filtration, bioreactors, and engineered wetlands is investigated for its potential to improve treatment performance. This research can be expanded in the future scope of study. According to test results, wastewater contamination in river ecosystems can be completely resolved by combining conventional and cutting-edge treatment techniques, guaranteeing safer and more sustainable water supplies for coming generations.

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EXPERIMENTAL INVESTIGATION ON CEMENT LESS PAVER BLOCK

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Abstract

In order to produce a safe environment, it is crucial to limit the amount of plastic solid trash because plastic garbage is growing daily as a result of population growth. Between 6% and 9% of the gross domestic product of developed nations is made up by the construction industry. The second-largest industry in the world is construction, behind agriculture.

In the building industry, lowering the amount of replacement construction is crucial. Therefore, in this project, we'll substitute the construction components with solid waste rather than using them. We are employing plastic garbage along with coarse aggregate to build the road's pavement since plastic waste has a high binding strength at melting point.

In this project, we intended to mix solid plastic trash, quarry dust, coarse aggregate, and ceramic waste in various ratios. In order to examine if it was possible to achieve adequate physical and mechanical qualities while taking temperature effects into account, solid plastic waste in varying quantities was employed to substitute cement.

After conducting the test utilizing solid waste as construction materials, compare and analyze the specimen with the standard building supplies to understand more. If the test case is valid, we can substitute solid plastic waste products for regular materials in the construction industry.

On the other hand, it can also lower the quantity of solid plastic waste produced and generate fresh ideas for innovation in the building industry. Our main goal is to protect the environment and the natural world from the difficulties caused by plastic solid waste.

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STUDIES ON FLEXURAL BEHAVIOUR OF BEAMS USING NON-CONVENTIONAL AGGREGATES

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Abstract

Common river sand is expensive due to excessive cost of transportation from natural sources. Also large-scale depletion of these sources creates environmental problems. As environmental transportation and other constraints make the availability and use of river sand less attractive a substitute or replacement product for concrete industry needs to be found. River sand is most commonly used fine aggregate in the production of concrete poses the problem of acute shortage in many areas. Whose continued use has started posing serious problems with respect to its availability, cost and environmental impact. This paper is part of a study investigating the structural characteristics of concrete using various combinations of Quarry rock dust, Sawdust and Vermiculite as complete replacement for conventional river sand fine aggregate. The quantity of Saw dust and Vermiculite used as a replacement percentage of 20% and 25% and quarry rock dust as hundred percent replacement. Concrete samples were prepared (cube, cylinder, and beam) and cured for7, 14, 28 days and tested in the laboratory to destruction in order to determine their compressive, flexural and tensile strength properties. These results compare favourably with those of conventional concrete. Vermiculite Insulation test is also proposed to find out the insulating properties of vermiculite. Design mix of M20 and M30 grades are used.

Keywords: compressive strength, Quarry rock dust, Saw dust, Vermiculite, Split tensile test, Flexural strength.

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SANITIZATION OF DOMESTIC AND VEHICLES RUN-OFF BY NATURAL COAGULATORS

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Abstract

This study investigates the efficiency of natural coagulants derived from Moringa oleifera seeds, banana peels, and cassava peels in treating synthetic turbid water designed for irrigation. An innovative extraction method was developed, in which the plant materials were directly added without prior elaborate processing, enhancing the release of active coagulant agents. Batch coagulation experiments were conducted using jar tests on water samples with initial turbidities of 100 NTU, 250 NTU, and 500 NTU. Results indicated that Moringa oleifera seed extracts achieved the highest turbidity removal efficiency compared to the other materials, while an optimum dosage of 0.5 mg/L was identified for both individual and blended coagulant applications. The study further extended its application to the treatment of wastewater from household and automobile sources, where the optimized coagulation process significantly reduced organic matter, high color, COD, BOD, and heavy metals. Subsequent polishing with a carbon filter containing sawdust further enhanced water quality, making the treated water suitable for irrigation. These findings highlight the potential of using plant-based coagulants as a sustainable and cost-effective alternative for water and wastewater treatment.

Keywords: Moringa oleifera, Banana Peels, Cassava peels.

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PLANNING AND DESIGN OF WATER SUPPLY SYSTEM FOR MUTHARASANALLUR VILLAGE, TRICHY, TAMILNADU, 620101

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Abstract:

Water is a vital chemical compound that exists in three states: liquid, solid, and gas. Each form plays a crucial role in supporting life benefiting humans, animals, plants, and other living organisms. In response to the increasing population in Mutharasanallur, a village near Trichy, we have proposed this water supply system. The existing water supply has become inadequate to meet the growing demands of the community. Mutharasanallur is located approximately 23 kilometers from Trichy and has a population of around 80,000 people. This project focuses on the planning and design of all water supply components in accordance with Indian Standard Codes. As part of the proposed system, approximately 21,600 liters of water will be treated daily through a designated treatment plant. The treatment plant is designed to process approximately 21,600 liters of water per day to ensure safe and adequate water supply for the residents of Mutharasanallur. The treatment process includes Screening and Sedimentation, Coagulation and Flocculation, Filtration and Disinfection. In Screening and Sedimentation, Large particles and suspended solids are removed through coarse screening and sedimentation tanks. During the process of Coagulation and Flocculation, the Chemical coagulants such as alum are added to bind fine particles into larger clumps (flocs), which settle out in the clarifiers. At the time of Filtration, The clarified water is passed through sand filters to remove any remaining impurities. Finally the Disinfection makes the water is disinfected using chlorine to eliminate harmful microorganisms and ensure safe drinking water. The entire design follows Indian Standard (IS) Codes such as IS 1172 (for water requirements), IS 10500 (for drinking water quality), and IS 3370 (for water retaining structures), ensuring safety, efficiency, and durability of the system. We have proposed this system for the increasing population in Mutharasanallur near trichy .Due to increase in population the available water supply is insufficient to fulfill the people requirements .So we selected this project.

Keywords: Water Supply, Population, Treatment Process and Standards

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ANALYTICAL STUDY ON AIR QUALITY STANDARDS

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Abstract

Air pollution has become a pressing global concern, affecting human health, ecosystem and climate change. This study aims to analyze the air quality by examining key pollutants including CO_2, $PM_{2.5}$, NO_2 and SO_2, across selected urban and suburban areas. Data was collected through air quality sensors and secondary sources to identify pollution levels and their primary sources. The findings indicate the high – traffic urban zones exhibit significant elevated pollutant concentration, particularly NO_2 and CO_2, primarily due to vehicular emissions. C to mitigate the negative impacts of air pollution implementing stricter emission regulations, promoting green transportation alternative sand expanding green cover are essential strategies for improving air quality and ensuring a healthier environment. The air quality monitoring ids mainly used in various cities like many polluted areas that are widely spread due to various pollutants like PM, CO, $C0_2$, NO etc. This has been due to the vehicle emissions, industrial effluents and environmental hazards. This has led to increase in air pollution, noise pollution and water pollution. The past few years air quality monitoring has very short readings over the years, and it has well developed in during these periods. Hence this has been the awareness to the people that air quality of air should be maintained.

Keywords: Air pollution, Pollutants, Urban pollution, Vehicular Seasonal variations and Emission regulations.

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INVESTIGATING THE MECHANICAL CHARACTERISTICS OF SELF-CURED BLENDED CONCRETE

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Abstract

Concrete's durability and compressive strength make it the most often used material in building today. To create plain concrete, specific amounts of cement, fine and coarse aggregates, and water are combined based on the type of job. To adequately hydrate and reach the required strength, conventional concrete needs a comfortable environment with moisture for at least 28 days. If concrete is not properly cured, its strength characteristics will be compromised. The time it takes for concrete to cure determines its strength. Cement hydration is caused by improper curing and can be effectively fixed by using self-curing concrete. The SC mixes were cured using a water-soluble polymer self-curing agent called polyethylene glycol (PEG 400). The right amount of self-curing gels can increase the strength and serviceability of concrete. In this study, standard concrete was examined and PEG by weight of cement in M40 grade concrete was adjusted from 0.5 percent to 0.5 percent, 1 percent, 1.5 percent, and 2 percent. The tests for blended concrete employing self-curing concrete's tensile, flexural, and compressive strengths are also included in this work.

Keywords: Compressive strength test, Flexural strength test, GGBS, Polyethylene-Glycol 400, Self- curing concrete, Split tensile test.

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AN EXPERIMENTAL STUDY ON ENHANCING THE QUALITY OF RECYCLED CONCRETE AGGREGATE USING SLURRY IMPREGNATION TECHNIQUE

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Abstract

The strengthening of recycled aggregates is a critical issue, as the low strength of recycled aggregates is the main reason that limits their widespread use. The slurry coating method can strengthen the recycled aggregates by repairing the aggregate surface, but it is hard to improve the internal strength due to the existence of pores and cracks. In this study, a new methodology considering dry mixing with fines to fill and bond the internal pores and cracks before slurry coating is proposed. Twelve strengthened samples considering different combinations of dry-mixing fines and coating solutions were prepared, and the basic physical and mechanical properties were compared, including the water-absorption rate, crushing value, and apparent density with un strengthen aggregates. The results indicate that the proposed methodology can change the water-absorption rate significantly and improve the crushing resistance and apparent density of the recycled aggregates. A high correlation between the apparent density and the crushing value was also observed. Furthermore, the strengthening mechanism of dry mixing was also investigated by scanning electron microscopy. The micro morphology of the strengthened aggregates indicates that internal pores and cracks can be filled by dry mixing fines and then bonded together after hydration.

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INVESTIGATION OF SELF HEALING CONCRETE USING FLYASH AND BACTERIA

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Abstract

Concrete is a widely used construction material, but its tendency to develop cracks reduces its durability and service life. This study explores the effectiveness of self-healing concrete by incorporating fly ash and bacteria to enhance crack repair and improve structural performance. The self-healing mechanism is driven by the metabolic activity of bacteria, such as Bacillus subtilis or Bacillus megaterium, which precipitate calcium carbonate ($CaCO_3$) when exposed to water and nutrients, sealing the cracks. Fly ash, an industrial byproduct, is added as a partial cement replacement to improve workability, reduce cement usage, and create a favorable environment for bacterial growth. Concrete specimens with varying proportions of fly ash and bacterial cultures are prepared and subjected to control cracking. The self-healing efficiency is evaluated through visual inspection, water permeability tests, and compressive strength recovery analysis. The results indicate that the combination of fly ash and bacteria significantly enhances crack-sealing efficiency, reduces permeability, and improves the overall durability of the concrete. This research highlights the potential of self-healing concrete as an innovative and sustainable solution for extending the lifespan of concrete structures, reducing maintenance costs, and promoting eco-friendly construction practices.

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DEVELOPMENT OF LOW COST WATER TREATMENT TECHNOLOGIES FOR RURAL AREAS

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Abstract

About one-fifth of people on earth lack the access to safe drinking water, a condition that resulted in the death of 2.2 million people in 2004, as per the records of United Nations. Clean water use being a prime concern in many communities of developing countries. Contaminated water plays significant role in taking numerous lives in these localities, for which a number of efforts are being made for accessing safe purified drinking water. Fortunately, efficient and cheap water purification systems are being utilized and being tried to be accessed worldwide for easy access to clean water.

In the following project we had tried to develop a "Low Cost Water Purification Technique" using the basic ideas of Slow Sand Filter, some locally available filter material like charcoal, bone char, sand, manganese modified sand, clay, rice husk, banana residue ash, anthracite and try to improve the methodology using the UV Filter, RO Filter, and Activated Carbon Filter mechanism. Main focus was removal of iron from surface water by adsorption and oxidation followed by precipitation technique. Among all the adsorption media used, manganese modified sand proved to be a good adsorbent in removal of iron. For oxidation followed by precipitation, the ash produced from banana residue was used which proved to give the best result in removal of iron and also was having the cheapest material cost. A ceramic membrane with locally collected clay and rice husk was prepared which also proved to be effective for removal of turbidity, but may be due to rigorous use of the filter or any manufacturing defect, there were cracks developed on its surface and was discarded for any further use.

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EXPERIMENTAL INVESTIGATION ON GREEN CONCRETE USING FLY ASH AND RECYCLED AGGREGATE

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Abstract

Currently, construction costs and sand shortages are increasing day by day. To combat this problem, sand in plastic form is partially replaced by other materials. Plastic waste is recycled in the form of new production materials that can be used as optional components of concrete, making it one of the best ways to deal with plastic waste. These techniques have also proven to be much more cost-effective than traditional methods. This paper proposes using plastic waste as random substitutes (10%, 20%, 30%) for natural river sand and testing for compressive strength, tensile strength, flexural strength and sustainability. purpose. With the amount of plastic used increasing day by day, the disposal of used plastic is a big problem. It was therefore concluded that sand must be replaced by plastic within 20 years so that the shortage of natural aggregates can be effectively dealt with and the used plastic are disposed effectively.

Keywords: Compressive strength, Tensile strength, Flexural strength, Green Concrete.

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EXPERIMENTAL INVESTIGATION ON THE BEHAVIOUR OF AIR ENTRAINING AGENT IN CONCRETE

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Abstract

Air entrained concrete is made either by using air entraining cement or by air entraining agent in correct proportion in the concrete mix. This can be done by using the chemical substance. The main function of air entraining agent in concrete is to produce micro air bubbles. Due to the presence of micro air bubbles the concrete strength is get increased up. In this we are going to investigate the behavior of different type of air entraining agent in the concrete and find out which of the air entrained agent is giving more strength to the mortar and the concrete cube.

Keywords: Aluminium sulphate, Hydrogen peroxide, Sodium sulphate anhydrate, Sodium chloride.

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AN EXPERIMENTAL INVESTIGATION ON LATHE SCRAPS FIBRE IN RCC BEAM

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Abstract

This study investigates the effect of incorporating Lathe Machine Scrap Reinforcement (LMSR) into M20 concrete, focusing on its mechanical properties and workability. The addition of LMSR was found to significantly enhance the concrete's compressive, tensile, and flexural strengths up to an optimal level of 1.5%, beyond which a slight decline in performance was observed. As the percentage of LMSR increased, the slump value decreased, indicating reduced workability due to the irregular shape and texture of the scrap, which increases internal friction within the mix. The study highlights that 1.5% LMSR offers the best balance between improved strength and workability. At this optimal percentage, the concrete displayed superior structural rigidity, with higher load bearing capacity and minimal deflection. Additionally, the use of LMSR reduces the need for traditional steel reinforcement, contributing to cost savings and promoting environmental sustainability by recycling industrial waste. The findings suggest that LMSR can be a promising alternative material for reinforcing concrete, offering both performance benefits and ecological advantages. The research supports further exploration of LMSR in concrete applications.

Keywords: LMSR, Compressive strength, Tensile strength, Flexural strength, Green Concrete.

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DESIGN AND IMPLEMENTATION OF A MENTAL HEALTH ASSISTANCE CHATBOT USING ARTIFICIAL INTELLIGENCE

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Abstract

Automatized mental health chatbots are conversationally built with technology in mind with having the potential to reduce efforts to healthcare costs and improve access to medical services and knowledge. This project introduces an innovative mental health assistance chatbot system designed to address queries related to depression, anxiety, and suicidal thoughts. Leveraging a Sequence-to-Sequence(Seq2Seq) neural network architecture implemented with PyTorch, the chatbot enhances its natural language understanding and response generation capabilities. The Seq2Seq model consists of two recurrent neural networks (RNNs) – an encoder and a decoder. The encoder processes user input, such as medical queries, into a fixed-size context vector. The decoder then generates a sequence of words representing the chatbot's response. By training on a diverse dataset encompassing various mental health intents, the model learns to provide contextually relevant and empathetic responses. The graphical user interface, developed using PyQt5, facilitates user interaction, enabling individuals to express their concerns and receive supportive and informative responses from the Health Seq Bot. Integration of Pyttsx3 voice library for conveying chat bot responses audibly, enhancing user engagement and accessibility. This project showcases the potential of Seq2Seq models in addressing mental health challenges, offering a compassionate and accessible resource for those in need of support and guidance.

Keywords: Mental health chatbot, Seq2Seq model, PyTorch, RNN, depression, anxiety, suicidal thoughts, PyQt5, Pyttsx3, healthcare AI, natural language processing,conversational AI, mental health support.

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INTELLIGENT ASSISTIVE TECHNOLOGY: VOICE GUIDED SMART GLASSES FOR VISUALLY IMPAIRED INDIVIDUALS

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Abstract

Visually impaired individuals encounter numerous challenges in independently navigating their surroundings and performing everyday tasks. Intelligent Assistant Technology, integrated into voice-guided smart glasses, presents a groundbreaking assistive solution that enhances accessibility, independence, and quality of life. These smart glasses leverage artificial intelligence (AI), computer vision, and natural language processing (NLP) to interpret the user's environment and deliver real-time auditory feedback. Equipped with a high-resolution camera, depth sensors, and an AI-powered processing unit, the system can detect objects, recognize faces, read text from documents and signboards, and provide obstacle detection alerts. The device functions by capturing live visual input, processing it through machine learning algorithms, and converting the information into descriptive audio output.

A speech recognition module allows users to interact with the system using voice commands, enabling hands-free operation. The incorporation of GPS and Bluetooth connectivity further extends the device's functionality, enabling location-based assistance, navigation support, and integration with smart phones or smart home devices. By offering features such as facial recognition for identifying familiar individuals, currency detection for financial transactions, and scene description for situational awareness, these smart glasses provide an intuitive and effective solution for the visually impaired. The technology promotes social inclusion, enhances safety, and fosters a greater sense of independence. With continuous advancements in AI and wearable technology, voice-guided smart glasses hold immense potential in revolutionizing assistive solutions for visually impaired individuals, bridging the gap between accessibility and autonomy in their daily lives.

Keywords: Voice-Guided Smart Glasses, Visually Impaired Assistance, AI, Computer Vision, NLP, Obstacle Detection, Object Recognition, Text-to-Speech, Speech Recognition

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DESIGN AND IMPLEMENTATION OF OBJECT CROSSING DETECTION FOR TRAIN USING ANN ALGORITHM

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Abstract

Vehicle crossings at busy intersections or restricted zones pose significant safety risks due to potential accidents involving pedestrians, vehicles, and other obstacles. Detecting objects near or within vehicle crossing areas is essential for preventing collisions and ensuring public safety. This research focuses on developing a smart vehicle crossing object detection and alert system using a Artificial Neural Network (ANN) algorithm. The system is designed to detect and classify objects around vehicle crossings in real-time, including pedestrians, other vehicles, and potential obstructions. By leveraging computer vision techniques, the system processes input from a video feed and identifies objects in both daytime conditions with high accuracy and speed.

Object detection is implemented using the YOLOv3 model, a pre-trained deep learning model, which classifies objects into safe or hazardous categories based on predefined criteria from a reference database. Upon detecting a hazardous object, the system generates an immediate voice alert using the pyttsx3 library, providing audible warnings to vehicle drivers and nearby pedestrians. This ensures prompt awareness of potential hazards and reduces the likelihood of accidents. The proposed system is reliable, user-friendly, and scalable, aiming to enhance safety at vehicle crossings through advanced AI-driven object detection and voice communication technologies.

Keywords: Object Detection, Artificial Neural Network (ANN),YOLOv3, Real-Time Monitoring, Computer Vision, Hazard Classification, Voice Alert System.

ISBN: 978-93-48505-24-8

DESIGN AND IMPLEMENTATION OF TINYCARE: A SMART IOT-BASED SYSTEM FOR AUTOMATED GROWTH MONITORING AND ATTENDANCE TRACKING IN ANGANWADI CENTERS

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Abstract

Regular growth monitoring is essential in early childhood development, serving as a key indicator of overall well-being. Health organizations emphasize tracking height and weight, as deviations from normal growth patterns may indicate health issues, nutritional deficiencies, or developmental concerns. However, many childcare and public health centers rely on manual monitoring methods, leading to inconsistencies and delays in intervention. Tiny Care is an innovative smart child growth monitoring system that automates the collection and analysis of height and weight data, ensuring accurate, real-time tracking. The system securely transmits growth records to a cloud-based platform, accessible via a web dashboard for administrators and a mobile app for caregivers and parents. This seamless integration empowers caregivers to monitor child growth trends and enables timely interventions. Beyond growth tracking, Tiny Care enhances community engagement by encouraging parental enrollment in Integrated Child Development Services (ICDS) at Anganwadi centers.

This initiative fosters collaboration between caregivers, Anganwadi workers, and the community, making child health tracking a shared responsibility. Looking ahead, TinyCare will integrate AI-powered predictive analytics to analyze growth patterns and detect early signs of malnutrition or developmental risks. Future enhancements will provide automated health insights, personalized recommendations, and real-time alerts to address health concerns proactively. By leveraging data-driven healthcare solutions, TinyCare establishes a scalable and adaptable framework for public healthcare programs and early childhood development initiatives.

Keywords: Child growth monitoring, Healthcare AI, Predictive analytics, Mental health chatbot, Natural language processing(NLP)

ISBN: 978-93-48505-24-8

DESIGN AND IMPLEMENTATION OF AUTOMATED MULTIPLE CHOICE QUESTIONS GENERATION USING CGAN'S FOR COMPUTER SCIENCE EDUCATION

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Abstract

The rapid advancement of artificial intelligence has significantly transformed the education sector, particularly in the automation of assessment tools. This project focuses on the design and implementation of an automated multiple-choice question (MCQ) generation system using Conditional Generative Adversarial Networks (cGANs) for computer science education. Traditional methods of MCQ creation are time-consuming and require substantial expertise. To address this challenge, this system leverages cGANs to generate high-quality, contextually relevant questions based on input text, ensuring diversity, difficulty balance, and conceptual correctness.

The proposed system consists of a training module, where the model learns from a dataset of computer science questions, and a generation module, which produces new MCQs based on user-defined topics or difficulty levels. The cGAN framework includes a generator network that creates MCQs and a discriminator network that evaluates their quality, refining the generated questions over time. The system integrates natural language processing (NLP) techniques to enhance question readability and relevance.

The project aims to provide an efficient, scalable, and automated solution for educators, reducing the effort needed for question formulation while ensuring high-quality assessments. The generated MCQs can be used in online learning platforms, academic institutions, and competitive exam preparations. Experimental results demonstrate the effectiveness of the model in producing diverse and meaningful questions, showcasing its potential to revolutionize automated assessment in computer science education.

Keywords: Automated Multiple Choice Question (MCQ) Generation, Conditional Generative Adversarial Networks (cGANs), Artificial Intelligence (AI), Natural Language Processing (NLP), Deep Learning, Text Generation, Question Quality Evaluation.

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DESIGN AND IMPLEMENTATION OF A SMART LEAVE MANAGEMENT SYSTEM USING REACT.JS

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Abstract

The web-based Student & Faculty Leave Management System is designed to streamline the leave request and approval process within educational institutions by offering an efficient and transparent method for students to submit leave applications online while enabling faculty members to review, approve, or reject requests with optional feedback. By eliminating manual paperwork, the system reduces processing time and administrative workload, allowing students to track the status of their requests and receive real-time notifications regarding approvals or rejections. Faculty members benefit from a centralized dashboard to efficiently manage multiple leave applications. The application is built using React.js for the frontend, ensuring a modern, responsive, and user-friendly interface, while the backend is powered by Django, leveraging the Django REST Framework (DRF) to handle API requests, user authentication, database management, and business logic. The system supports role-based access control, leave history tracking, and automated email notifications to enhance functionality and security. By integrating advanced web technologies, this system improves communication, ensures accurate record-keeping, and provides a seamless user experience, ultimately aiming to enhance transparency, reduce administrative burden, and establish an organized leave management process within academic institutions.

Keywords: Leave Management System, Student Leave Tracking, Faculty Leave Approval, React.js Frontend, Django Backend, Django REST Framework (DRF), Role-Based Access Control, Automated Notifications, Database Management, Web-Based Application, Education Management System, User Authentication, Real-Time Status Updates, Centralized Dashboard, Paperless Leave Processing.

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THE ROLE OF 5G SATELLITE NETWORKS IN BRIDGING THE DIGITAL DIVIDE

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Abstract

The emergence of 5G satellite communication systems represents a significant advancement in the field of wireless communication, enabling global connectivity with enhanced data speeds, low latency, and increased reliability. The integration of satellite networks with 5G technology provides an innovative solution to overcome the limitations of traditional terrestrial networks, particularly in remote or underserved regions. By leveraging low Earth orbit (LEO), medium Earth orbit (MEO), and geostationary Earth orbit (GEO) satellites, 5G satellites offer seamless communication coverage, high-speed data transfer, and reduced latency, which are essential for applications such as autonomous vehicles, remote healthcare, and IoT networks. Challenges in the implementation of 5G satellite systems include the complex integration of satellite and terrestrial networks, spectrum management, and the development of efficient communication protocols. such as beam forming, frequency reuse, and advanced antenna systems, are expected to mitigate these challenges. The collaboration between satellite operators, telecommunication companies, and regulatory bodies will be crucial in unlocking the full potential of 5G satellite networks and ensuring global connectivity for future generations.

Keywords: 5G satellite, communication systems, global connectivity, low Earth orbit, highspeed data transfer, low latency, IoT, remote healthcare, satellite-5G integration, spectrum management.

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DESIGN AND IMPLEMENTATION AI-POWERED SMART LIBRARY ENHANCING NAVIGATION AND ACCESSIBILITY WITH VOICE ASSISTANT

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Abstract

In the digital age, libraries are evolving to provide more efficient and accessible services. This paper presents the design and implementation of an AI-powered Smart Library system, integrating voice-assisted navigation and accessibility features to enhance the user experience. The system leverages Natural Language Processing (NLP), Machine Learning (ML), and Internet of Things (IoT) to facilitate seamless interaction between users and library resources. The voice assistant enables users to search for books, locate them within the library, check availability, and receive personalized recommendations. Additionally, the system incorporates real-time book tracking, automated cataloging, and accessibility features for visually impaired users, ensuring inclusivity. The architecture consists of a cloud-based database, a mobile application, and a smart navigation system that guides users to their desired books using IoT-enabled smart shelves. The implementation of this system enhances the efficiency of library operations, reduces manual effort, and provides a more engaging and interactive experience for library visitors. Future advancements could include AI-driven chatbots for remote assistance and integration with Augmented Reality (AR) for enhanced navigation**.**A cloud-based database ensures seamless book cataloging, automated check-in/check-out processes, and integration with library management systems. To enhance accessibility, the system includes text-to-speech and speech-to-text features, assisting visually impaired users in accessing library resources effortlessly**.**

Keywords: AI-powered library, Voice Assistant, Smart Navigation, NLP, IoT, Accessibility, Library Automation.

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IMPLEMENTATION OF AUTOMATIC SMART ATTENDANCE REGISTER AND MONITORING USING FACIAL LANDMARK ALGORITHM

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Abstract

Attendance maintenance is a crucial task for educational institutions, as it plays a significant role in tracking student presence and ensuring accountability. However, when done manually, it can become a cumbersome and time-consuming process for teachers. Traditional methods of taking attendance, such as calling out names or signing logbooks, not only consume valuable class time but also leave room for errors and manipulations, such as proxy attendance or false entries. To overcome these limitations, an automated and intelligent attendance management system has been developed, leveraging advanced technologies such as facial recognition and live video streaming. This system aims to simplify and streamline the attendance process while enhancing its accuracy and reliability. By integrating facial recognition techniques, the system can efficiently identify and mark student attendance without the need for manual intervention. The process begins with capturing a live video stream of the classroom environment. Additionally, this approach enhances security by reducing the chances of attendance forgery. Teachers can focus on delivering lectures rather than spending time marking attendance, leading to improved productivity and classroom efficiency. Furthermore, the system can generate detailed attendance reports and analytics, which can be accessed by teachers and administrators. These reports provide valuable insights into student attendance patterns, enabling institutions to identify students with irregular attendance and take necessary actions. In conclusion, implementing an automated attendance management system using facial recognition technology not only simplifies attendance tracking but also ensures accuracy, reduces manual effort, and enhances classroom efficiency. With the increasing integration of artificial intelligence and computer vision in education, such innovative solutions are paving the way for smarter and more efficient learning environments.

Keywords: Live video streaming, Facial recognition, and Manual attendance.

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AI-POWERED PERSONAL LIFE COACH & DECISION-MAKING ASSISTANT

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Abstract

Artificial Intelligence (AI) is transforming human-computer interactions by enabling systems to understand and respond to user emotions, behaviour, and needs in real time. While existing AI assistants provide basic automation and voice-based interactions, they lack deep emotional intelligence, personalized decision-making, and multimodal processing capabilities. This project introduces, an AI-powered personal assistant designed to enhance user engagement by integrating emotion recognition, voice analysis, and intelligent decision-making. The system utilizes Convolutional Neural Networks (CNN) for facial emotion detection, Long Short-Term Memory (LSTM) networks for voice sentiment analysis, and Natural Language Processing (NLP) for text-based sentiment understanding.

A content-based filtering system enhances Friday's recommendation engine, allowing it to suggest music, exercises, or relaxation techniques based on past user preferences and current emotional state. The assistant is integrated into a futuristic UI using Eel (Python-Web bridge), featuring real-time animations, neon-glow effects, and interactive widgets that display emotion tracking, health status, and system responses dynamically.

The implementation of real-time simultaneous processing ensures that all functionalities operate concurrently without delays, providing a seamless and immersive experience. By combining AI-driven emotional intelligence, voice-based assistance, and real-time decision-making, and daily assistance. This project sets a new standard for AI assistants by bridging the gap between emotion-aware computing and practical AI-driven solutions, making interactions more natural, intelligent, and adaptive.

Keywords: AI-powered virtual assistant, Facial expression analysis, Sentiment analysis, Speech emotion recognition, Voice-based AI assistant, Real-time emotion detection, AI-driven decision-making, Personalized AI recommendations.

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DESIGN AND IMPLEMENTATION OF LOW-COST EYE GESTURE COMMUNICATION SYSTEM FOR PEOPLE WITH MOTOR DISABILITIES

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Abstract

Individuals with severe motor disabilities, such as those caused by ALS, cerebral palsy, or spinal cord injuries, often face significant challenges in communication and interaction with their environment. This paper presents a low-cost eye gesture-based communication system designed to enhance accessibility and independence. The system utilizes a webcam or an infrared-based eye-tracking module to detect and interpret eye movements, which are then mapped to predefined commands for speech synthesis, device control, and text input. Machine learning algorithms process real-time eye gestures, ensuring high accuracy and responsiveness. Unlike expensive commercial alternatives, this system leverages affordable hardware and open-source software, making it accessible to a wider population. Potential applications include speech assistance, smart home control, wheelchair navigation, and human-computer interaction. The proposed system significantly improves the quality of life for individuals with motor impairments, enabling seamless communication and interaction with digital and physical environments.

Keywords: Eye Gesture Recognition, Assistive Technology, Motor Disabilities, Wheelchair Control, Computer Vision, Real-Time Processing, Low-Cost System, Image Processing.

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DESIGN AND IMPLEMENTATION OF DRIVER DROWSINESS DETECTION SYSTEM USING OPENCV

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Abstract

Road accidents due to driver fatigue and drowsiness have become a significant concern worldwide, leading to loss of lives, property damage, and economic burdens. A Driver Drowsiness Detection System (DDS) is an advanced safety mechanism designed to prevent accidents by monitoring a driver's alertness and providing timely warnings. This paper presents an efficient and real-time drowsiness detection system that integrates machine learning, image processing, and sensor-based methodologies to enhance road safety. The proposed system employs a combination of facial recognition, eye state monitoring, and head movement tracking to determine signs of fatigue. Using a camera positioned in front of the driver, real-time video frames are captured and analyzed to detect eye closure duration, yawning frequency, and head tilting, which are indicative of drowsiness. Advanced image processing techniques, such as Haar cascades and deep learning-based Convolutional Neural Networks (CNNs), are utilized for accurate face and eye feature extraction. The system continuously processes these multimodal data sources and applies fusion techniques to enhance prediction reliability. When the system detects signs of drowsiness, it issues real-time alerts through auditory alarms, visual notifications, or haptic feedback to ensure the driver regains focus. The effectiveness of the proposed DDS is evaluated using benchmark datasets, such as the NTHU Drowsy Driver Dataset, along with real-world testing in simulated and on-road environments. Experimental results demonstrate high accuracy in detecting drowsiness, surpassing conventional methods that rely solely on eye blink frequency. The system is designed for integration with in-vehicle infotainment systems, making it suitable for commercial and personal use

Keywords: Driver Drowsiness Detection, Machine Learning, Image Processing, Convolutional Neural Networks, Sensor Fusion, Road Safety, Artificial Intelligence.

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CREATING AN INTERACTIVE AND ENGAGING SOCIAL MEDIA APP USING MERN STACK

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Abstract

Social media platforms have transformed digital communication, enabling seamless interactions, content sharing, and community building. This project focuses on the development of a highly interactive and engaging social media application using the MERN (MongoDB, Express.js, React, Node.js) stack. The primary goal is to enhance user engagement through real-time interactions, intuitive design, and scalable architecture. The application incorporates essential features such as user authentication, dynamic content sharing, likes, comments, and a real-time notification system. React is leveraged for building a responsive and dynamic frontend, while Node.js and Express.js power the backend, ensuring efficient API performance. MongoDB, with its flexible NoSQL architecture, facilitates seamless data management for large-scale user interactions. Web Sockets are integrated to enable real-time messaging and updates, enhancing the overall user experience. This project highlights best practices in full-stack development, including performance optimization, security measures, and modular architecture.

Keywords: Social Media, MERN Stack, Full Stack Development, Real-time Communication, User Engagement And Scalable Architecture.

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BEYOND DISCOUNT: BUILDING A SUSTAINABLE E-COMMERCE REVENUE MODEL

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Abstract

The e-commerce industry has witnessed significant fluctuations, with some businesses thriving while others fading. This study explores the factors contributing to the sustainability of ecommerce revenue models by analyzing why many startup e-commerce platforms fail while industry giants continue to grow.The research focuses on key reasons for failure, such as excessive cash burn, weak supply chains, lack of consumer trust, and inability to scale. Ecommerce platforms like Jabong, Snapdeal, and Paytm Mall struggled due to these challenges, whereas Amazon and Flipkart sustained growth through financial strength, advanced logistics, customer loyalty programs, transparency, and reliable services. Similarly, in the food delivery sector, companies like Uber Eats India, Foodpanda India, and Dunzo faced difficulties due to high operational costs, poor differentiation, and inefficient delivery networks. However, Zomato and Swiggy adapted by expanding services, leveraging advertising, introducing premium memberships, and strengthening logistics.Ride-hailing services also faced similar challenges. While TaxiForSure, Didi Chuxing, and Meru Cabs failed due to financial losses, regulatory issues, and poor customer adoption, companies like Uber, Ola, and Rapido thrived by utilizing advanced technology, network effects, financial backing, and adaptability.This analysis highlights critical success factors, including financial backing, customer-centric approaches, strong supply chain partnerships, adaptability, and a focus on quality over discounts. The findings provide insights into building sustainable e-commerce revenue models and strategies for long-term business success.

Keywords: Financial backing, customer-centric approaches, supply chain partnerships, adaptability, quality over discount

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IMPLEMENTATION AND ANALYSIS OF YIELD PREDICTION AND TEXTURE USING CONVOLUTIONAL NEURAL NETWORK

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Abstract

Accurate assessment of rice yield is essential for enhancing agricultural efficiency and ensuring food security. This paper proposes an innovative hybrid model that integrates convolutional neural networks (CNNs) for analysing field images with traditional regression techniques to process environmental variables. The system estimates rice yield in both grams per square meter (g/m^2) and tons per hectare (t/ha), enabling farmers to project potential revenue and optimize resource allocation for greater profitability. The model, developed using PyTorch, utilizes a pre-trained CNN to extract critical features from crop images, with a regression layer dedicated to precise yield evaluation. In addition to yield estimation, the study introduces a comprehensive rice grain texture classification framework based on morphological analysis. This module not only classifies grains into categories—Slender, Medium, Bold, and Round—but also provides valuable metrics, including the number of grains, individual grain thickness, and the average thickness across all grains. Since rice market prices can vary based on grain thickness, this information enables farmers to plan their harvests strategically, maximizing profits by targeting the most profitable rice grades. The framework employs advanced image pre processing techniques, such as thresodling, erosion, dilation, and edge detection, to isolate individual grains and perform accurate structural analysis. The fusion of deep learning and classical image processing techniques provides a robust solution for both yield estimation and grain classification, contributing significantly to precision agriculture. Future enhancements will focus on incorporating additional environmental parameters and deploying the system in real-world farming environments to further support profitable agricultural practices.

Keywords: Rice Yield Estimation, Grain Texture Classification, Convolutional Neural Networks, Regression Models, Image Processing.

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IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE SIGHT CLICK - A TOUCH FREE MOUSE FOR THE FUTURE

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Abstract

With the advancement of artificial intelligence (AI) and human-computer interaction technologies, traditional input devices like the mouse and keyboard are gradually being replaced by more intuitive and touch-free alternatives. This project, Artificial Intelligence Sight Click: A Touch-Free Mouse for the Future, introduces a revolutionary approach that allows users to control a computer using only their eye movements, blinks, and facial gestures, eliminating the need for physical touch. The proposed system integrates computer vision, deep learning, and eye-tracking technologies to accurately track the user's gaze and facial expressions, interpreting them as commands for cursor movement and clicks. By leveraging machine learning algorithms, the system ensures precise and real-time interaction, enhancing usability for individuals with disabilities, professionals working in sterile environments, and users seeking a more futuristic way to interact with digital devices. This AI-powered solution is designed to be efficient, accurate, and adaptable across multiple applications, including healthcare, gaming, virtual reality (VR), industrial automation, and smart environments. The project focuses on key challenges such as gaze-tracking accuracy, real-time responsiveness, and adaptive calibration to accommodate different users. The touch-free interaction model not only improves accessibility for individuals with limited mobility but also reduces the risk of contamination in high-touch environments like hospitals and laboratories. By developing a robust AI-based touch-free mouse, this project paves the way for the next generation of human-computer interaction, offering an innovative, hands-free, and intelligent alternative to traditional input methods. The research and implementation of Artificial Intelligence Sight Click demonstrate the potential of AI in making technology more inclusive, efficient, and futuristic.

Keywords: Artificial Intelligence (AI), Eye-Tracking Technology, Human-Computer Interaction (HCI), Gesture-Based Control.

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AI-BASED FRONT DOOR SECURITY SYSTEM WITH FACE RECOGNITION AND REMOTE GUEST AUTHORIZATION

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Abstract

Nowadays cards like ATM, credit, debit and other cards are used for bank transactionsandplayacrucialroleinthebankingarea.Thispaperproposesasecure, robust and flexible biometric authentication system which combines two methods that use a Biometric and a proximity sensor. To increase the security level in ATM transaction this proposal integrates a biometric fingerprint technique along with a shuffling keypad method. Here the card is replaced with the fingerprint, which is registered during the opening of a bank account and PIN number is entered in a shuffling keypad. To avoid the shoulder-surfing attacks with or without concealed cameras in PIN entry, this approach uses a shuffling keypad which uses a proximity sensor to shuffle the keypad during the PIN entry. The system is tested with multiple users and has obtained 100% accuracy. This system avoids the misuse of electronic cards and supports a secure transaction.

Keywords: AI-Based Facial Recognition, Biometric Authentication System, ATM Fraud Prevention, Unauthorized Access Detection, Face Data Verification in ATM, Secure Banking System Using Face Recognition, Real-Time Police Portal Notification, Anonymous User Detection, Police Portal Integration

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SCALABLE AND SECURE CLOUD COMPUTING: A FRAMEWORK FOR OPTIMIZED RESOURCE ALLOCATION AND DATA PROTECTION

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Abstract

Cloud computing has revolutionized the way organizations store, process, and manage data. However, as cloud adoption increases, so do concerns about security, scalability, and resource optimization. This paper presents a novel framework for cloud computing that addresses these challenges. Our framework utilizes a combination of machine learning algorithms and software-defined networking (SDN) to optimize resource allocation and ensure data protection. We evaluate our framework using real-world workload traces and demonstrate significant improvements in resource utilization, security, and scalability. The proposed framework provides a scalable, secure, and efficient solution for cloud computing, enabling organizations to fully leverage the benefits of cloud technology. Additionally, our framework ensures compliance with major cloud security standards and regulations, providing a reliable and trustworthy solution for organizations. The experimental results show that our framework achieves an average improvement of 25% in resource utilization, 30% in security, and 20% in scalability compared to existing cloud computing frameworks.

Keywords: Cloud Computing, Resource Allocation, Data Protection, Machine Learning, Software-Defined Networking (SDN), Scalability, Security, Compliance.

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ANALYZING AND PREDICTION OF LUNG CANCER USING MULTI-CLASS VECTOR MACHINE ON COMPUTED TOMOGRAPHY IMAGES

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Abstract

Lung cancer is a critical health concern globally with early detection being key to improving survival rates. This study presents a machine learning-based approach for analyzing and predicting lung cancer using computed tomography images this method employs a multi-class support vector machine to classify lung conditions into varies categories including malignant tumors, benign nodules and healthy tissue the process begins with preprocessing of scans for quality of image followed to segment and extract the image to gather relevant patterns from the lung regions This approach demonstrates power as a supportive diagnostic tool aiming for assist health professionals in early and accurate identification of lung cancer.

Keywords: Computed Tomography, Multi-class Support Vector Machine, Convolutional Neural Network, Random Forests, Regions of Interest, Histogram of Oriented Gradients, Gray Level Co-occurrence Matrix.

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RAINFALL PREDICTION USING MACHINE LEARNING

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Abstract

Accurate rainfall prediction is a fundamental aspect of meteorology, playing a vital role in weather forecasting, disaster management, and water resource planning. This project leverages machine learning (ML) techniques to develop a robust rainfall prediction system using Python. By analyzing historical weather data, the model identifies complex relationships between key meteorological parameters such as temperature, humidity, wind speed, and atmospheric pressure to forecast both the likelihood and intensity of rainfall in specific regions. The project follows a structured approach, starting with data collection from meteorological stations and satellite sources. The raw data undergoes rigorous preprocessing, including handling missing values, feature normalization, and selection of the most influential attributes through statistical and algorithmic techniques. Various ML models, including linear regression, decision trees, and advanced neural networks, are trained and optimized using hyperparameter tuning to enhance predictive accuracy.

To ensure model reliability, rigorous evaluation is performed using performance metrics such as Mean Absolute Error (MAE) and Root Mean Square Error (RMSE). Cross-validation techniques like k-fold validation further improve model generalization. The trained model is integrated into a real-time prediction system, enabling dynamic forecasts via web services and cloud-based applications. This machine learning-driven approach to rainfall prediction enhances traditional forecasting methods by improving accuracy and adaptability to complex weather patterns. The system holds significant value in sectors such as agriculture, flood prevention, and urban planning, aiding in informed decision-making and efficient resource management. By continuously updating the model with new data, the system ensures long-term effectiveness, making it a powerful tool in modern meteorology.

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INDUSTRY 4.0: TRANSFORMING MANUFACTURING THROUGH ADVANCED TECHNOLOGIES

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Abstract

Industry 4.0 represents the fourth industrial revolution, characterized by the integration of advanced technologies such as the Internet of Things (IoT), artificial intelligence (AI), big data analytics, robotics, and cloud computing within manufacturing. This paradigm shift enables real-time data exchange among machines, systems, and human operators, fostering smart factories that enhance efficiency, productivity, and flexibility. Industry 4.0 promotes cyber-physical systems that facilitate interconnectedness of physical and digital environments, allowing for predictive maintenance, optimized production schedules, and customized manufacturing solutions.

The implications of Industry 4.0 extend beyond mere efficiency gains; they encompass environmental sustainability through reduced waste and energy consumption, as well as enhanced supply chain resilience. Additionally, evolving workforce skills are essential in adapting to automated systems and data analytics. However, challenges such as data security, privacy concerns, and the digital divide must be addressed to ensure equitable benefits across all workforce segments. This abstract outlines the key components and implications of Industry 4.0, emphasizing its potential to transform traditional manufacturing, elevate supply chain transparency, and drive sustainable growth. The successful implementation of these technologies enhances performance while promoting innovation and competitiveness in an increasingly globalized market.

In conclusion, embracing Industry 4.0 allows organizations to harness its transformative power, ultimately leading to a more resilient, agile, and interconnected industrial landscape.

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AI AND BLOCKCHAIN FOR SECURE DATA TRANSACTIONS

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Abstract

The integration of AI and blockchain technology to enhance the security, efficiency, and transparency of data transactions. AI contributes through predictive analytics, anomaly detection, and intelligent automation, while blockchain ensures data immutability, decentralization, and transparency. The combination of these technologies provides a robust framework for securing sensitive data, reducing fraudulent activities, and improving trust in digital transactions.AI enhances blockchain by optimizing consensus mechanisms, detecting security breaches, and automating smart contract execution, ensuring adaptive and self-improving security protocols. Meanwhile, blockchain ensures transparency and prevents data tampering by maintaining a distributed and immutable ledger, allowing AI to access verifiable and trustworthy datasets.

This integration not only strengthens cybersecurity but also introduces new possibilities for secure, decentralized AI-driven applications across multiple industries. Furthermore, this paper discusses the synergy between AI and blockchain, their practical implementations in financial services, healthcare, supply chain management, and cybersecurity, as well as the challenges and ethical considerations in their integration. Future research directions include addressing scalability issues, refining AI bias mitigation techniques, and enhancing the interoperability of blockchain networks with AI-driven systems. AI plays a critical role in identifying fraudulent activities, predicting cyber threats, and automating security measures. Meanwhile, blockchain offers a decentralized and immutable ledger system, ensuring transparency and protection against unauthorized alterations.

Keywords: AI, Blockchain, Secure Data Transactions, Smart Contracts, Decentralization, Secure Data Transaction, Cybersecurity.

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ENHANCING FAKE NEWS DETECTION WITH RECURRENT NEURAL NETWORKS: A DEEP LEARNING APPROACH

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Abstract

In today's advanced age, the unchecked expansion of untrue data postures a critical danger, with fake news on social media and other stages causing genuine social and national repercussions. Tending to this challenge, this consider investigates machine learning methods to identify and moderate the spread of fake news. Particularly, it presents an arrangement leveraging a Repetitive Neural Arrange (RNN) to distinguish fake news successfully. The demonstrate was prepared on two datasets comprising true and created news articles, utilizing progressed content preprocessing procedures, counting tokenization and inserting. Assessment measurements such as exactness, exactness, and review were utilized to get the model's execution. The comes about illustrate that the RNN based approach accomplishes tall precision, building up it as a strong apparatus for fake news discovery.

Keywords — Fake News Discovery, Repetitive Neural Organize (RNN), Machine Learning, Social Media, Evaluation Measurements

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AI-DRIVEN HEALTHCARE SYSTEM FOR DOCTOR RECOMMENDATION AND VIDEO CONSULTATION BASED ON FACIAL EXPRESSION AND SPEECH ANALYSIS

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Abstract

Telehealth has revolutionized healthcare by making it possible for patients to consult with doctors remotely, reducing the need to visit hospitals or clinics. However, despite its convenience, traditional telehealth systems often fall short when it comes to offering truly personalized and holistic care. One major limitation is the difficulty in understanding a patient's emotional state during a virtual consultation. These platforms also tend to rely on general treatment approaches, rather than matching patients with the right healthcare professionals based on their individual needs. This project presents a next-generation, AI-powered telehealth system that aims to bridge these gaps. Using content-based filtering, it connects patients with the most suitable healthcare providers based on their unique symptoms and emotional cues. Real-time video consultations are enhanced with secure technology that allows doctors to observe and assess facial and speech indicators, helping them respond more empathetically and accurately. The platform also includes a feedback loop to continually improve the quality of recommendations and overall patient care. By combining advanced AI with a focus on emotional intelligence and personalization, this system brings a more human touch to remote healthcare—pushing telehealth beyond convenience and into the realm of truly comprehensive care.

Keywords: AI-driven healthcare, Smart healthcare system, AI in telemedicine, AI-powered doctor recommendation, Virtual health assistant, Emotion recognition, Facial expression analysis, Sentiment analysis, Speech emotion detection, Voice-based health assessment, AI-driven patient diagnosis, Non-verbal communication analysis.

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DESIGN AND IMPLEMENTATION OF SIGN LANGUAGE TO ENGLISH TEXT CONVERSION SYSTEM USING DEEP LEARNING

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Abstract

Communication is a fundamental human need, yet people with hearing and speech impairments often face challenges in expressing themselves to the broader community. Sign language is their primary mode of communication, but it is not universally understood. This project proposes a deep learning-based system that translates sign language gestures into English text in real-time, enabling seamless interaction between sign language users and non-signers. The proposed system utilizes a Convolutional Neural Network (CNN) and Long Short- Term Memory (LSTM) architecture to recognize and interpret dynamic hand gestures captured through video or image input. Preprocessing steps such as background subtraction, hand segmentation, and feature extraction are applied to enhance recognition accuracy. A custom or publicly available dataset of sign language gestures is used for model training and evaluation. The model achieves high accuracy in gesture recognition through data augmentation, transfer learning, and fine-tuning of hyper parameters. This system offers a scalable solution for real-world applications such as mobile apps, educational tools, and assistive communication devices. Future improvements may include the incorporation of facial expressions, real-time feedback, and multilingual translation capabilities. This work contributes to bridging the communication gap between the hearing-impaired and the general population, demonstrating how deep learning can empower inclusive and accessible technologies.

Keywords: Sign Language Recognition, Deep Learning, CNN, LSTM, Gesture Recognition, Human-Computer Interaction, Assistive Technology.

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DEEPSHIELD: AI POWERED DEEPFAKE DETECTION & VICTIM SUPPORT

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Abstract

In an era where synthetic media is evolving at an unprecedented pace, deepfakes have emerged as one of the most alarming digital threats. Deepfakes use artificial intelligence to fabricate images, audio, and videos in a way that can convincingly misrepresent individuals—often without their consent. These digital manipulations have been used in misinformation campaigns, cyber fraud, non-consensual explicit content, and political propaganda, leading to significant psychological, reputational, and financial harm. The exponential rise of deepfakes—growing by over 900% between 2019 and 2023—demands an urgent and robust solution. DeepShield was developed as a comprehensive response to this evolving threat. DeepShield is an AI-powered platform designed to provide real-time deepfake detection and holistic victim support. At its core, it employs advanced deep learning models capable of detecting manipulated videos with up to 98% accuracy. Through integration with platforms like Twitter via API, DeepShield can monitor content in real time and identify potential deepfakes as soon as they appear. FaceForensics is used to analyze facial inconsistencies and subtle distortions, enhancing detection precision. This ensures that the platform not only identifies threats swiftly but does so with high reliability. Beyond detection, DeepShield is committed to supporting victims on multiple fronts. The platform incorporates a natural language processing (NLP) chatbot that is available 24/7 to provide immediate emotional and informational support.

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ADVANCES IN MULTI-TURN DIALOGUE SYSTEMS: A COMPREHENSIVE SURVEY ON RESPONSE SELECTION TECHNIQUES AND MODEL ENHANCEMENTS

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Abstract

This literature survey provides a comprehensive review of recent advancements in multi-turn dialogue systems, with a particular focus on response selection techniques and model enhancements. The survey explores various methodologies, including attention mechanisms, deep utterance aggregation, dialogue dependency parsing, and domain knowledge integration, among others. It examines how these approaches address the challenges of maintaining context, relevance, and coherence in multi-turn conversations. Additionally, the paper discusses the use of large language models (LLMs) in multi-turn interactions, highlighting the importance of effective evaluation frameworks and the role of feedback in improving model performance. By comparing and analyzing ten significant research contributions, this survey identifies key trends, common limitations, and future directions in the development of more robust and accurate multi-turn dialogue systems. The findings underscore the ongoing need for innovation in handling complex conversational scenarios, with particular emphasis on enhancing contextual understanding and response relevance in diverse application domains.

Keywords— Multi-turn Dialogue Systems, Response Selection, Attention Mechanisms, Contextual Understanding, Dialogue Dependency Parsing, Conversational AI

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SCHEDULING IN A LEAST INTERFERENCE EFFECT ALGORITHM BASED ON MANET

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Abstract

Scheduling reduces computer complexity by allowing simultaneous interference cancellation and reception. The receiver's traffic demands are avoided by the scheduling. We are suggesting a heuristic algorithm to address path loss and traffic needs. The algorithm is based on the link's interference effect. To prevent collisions during transmission between several transmitters and a single receiver, we employ Carrier Sense several Access with Collision Avoidance (CSMA/CA). With minimal computational complexity, we model the algorithm in Wireless Mobile Ad-hoc Networks. Index terms include CSMA/CA, scheduling, MANET, and interference effect.

AI- POWERED SYSTEM FOR STREAMLINED COLLEGE MANAGEMENT AND LEARNING

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Abstract

The digital transformation of the education sector has created a growing need for integrated platforms that can simplify both academic and administrative operations. This AI-powered system combines the core functionalities of an ERP solution with intelligent classroom management tools to deliver a seamless experience for educators, students, and administrators. Key features include automated attendance tracking through facial recognition or RFID, AI assisted lesson planning, real-time engagement monitoring, and secure

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communication through push notifications and in-app messaging. The platform also supports automated grade tracking, smart allocation of learning resources, and AI-driven behavioral insights that help teachers better understand and support their students. Designed for both web and mobile access, the platform ensures convenience and accessibility for all users. Teachers and administrators benefit from an intuitive dashboard offering detailed analytics, resource planning tools, and performance tracking. Students and parents receive realtime academic updates, progress reports, and direct communication channels, fostering transparency and collaboration. This approach not only modernizes classroom management but also empowers institutions to make informed, datadriven decisions.

PROPOSAL TO REVOLUTIONIZE HUMANITARIAN AID THROUGH LORA TECHNOLOGY AND DRONES

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Abstract

This paper investigates the incorporation of LoRa technology into humanitarian aid efforts through UAVs to improve disaster response in hard-to-reach locations. By enhancing communication and coordination, it aspires to accelerate and increase the effectiveness of aid distribution. The research underscores the significance of LoRa in real-time monitoring and communication, highlighting its potential to preserve lives and enhance resilience during disasters. Keywords—Humanitarian aid, Long Range (LoRa) technology, Unmanned Aerial Vehicles (UAVs), disaster response, communication technology, aid delivery, real-time monitoring, resilience.

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AN EFFECTIVE AI-DRIVEN RATIONAL HEALTH COMPANION BASED ON THE INTEGRADABLE EMOTION DETECTION

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Abstract

In the quickly evolving digital age, mental health awareness is essential than ever. Consequently, technology contributes to mental health conditions like depression, treatment, and sporadic follow-up. This study looks at chatbots, which take advantage in intelligent technology to recognize user emotions and react thoughtfully. It is built using advanced computer learning to get better. The main issues will include an advanced artificial intelligence-powered chatbot designed to understand user's emotional states and provide considerate, timely responses. At registration, users select a random image, which is subsequently divided into encrypted shares for security. The chatbot provides educational images and personalised information by analysing user input. The application contains an extensive feedback and technological advancements.

Keywords: Chatbots, Mental Illness, security, feedback, Health, Intelligent Technology

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ENERGY-SAVING INTRUSION DETECTION SYSTEM (IDS) AND DNN MODEL-BASED FEATURE SELECTION FOR IOT

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Abstract

To reduce these risks and avoid system paralysis in, it is crucial to create novel methods for establishing strong security layers in Internet of Things (IoT) networks. The low processing power and storage capabilities of the majority of IoT devices mean that current attack protection techniques frequently need to be modified. An energy-efficient Intrusion Detection System (IDS) and feature selection (FS) for IoT using Deep and Convolutional Network (DNN), aims to balance security with the resource constraints of IoT devices. In first phase, Clustered Data Processing technique is applied for the feature selection of dataset. By identifying relationships between input attributes, this technique automatically creates self-organizing models of optimal complexity. In the next phase, DNN based detection model is applied by means of training and testing. Experimental results show that the proposed FS-DNN model outperforms the existing models with respect to accuracy and F1-score metrics.

Keywords--Internet of Things (IoT), Intrusion Detection System (IDS), Deep and Convolutional Network (DNN), Feature selection, Clustered Data Processing

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AI MENTAL HEALTH COMPANION: PERSONAL AI MENTAL HEALTH THERAPIST

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Abstract

Artificial Intelligence (AI) is rapidly adapting to many sectors, with mental health being one of its main areas of impact. This review examines the integration of AI in mental health services, highlighting current trends, ethical issues, and future advances in this field. We review the current literature, presenting different AI applications as Well as ethical issues affecting the field. We also analyzed the management process and the state of R&D. Our search referenced four databases: Pub Med, IEEE Xplore, Psyc INFO, and Google Scholar. We included studies published in peer-reviewed journals, conferences, or established online resources that specifically focus on the Use of cognitive skills in psychology, as well as language reviews that improve upon existing English-language studies. Research shows that

AI has significant transformative potential, with new applications such as early diagnosis of mental illness, treatment strategies, and AI-powered virtual doctors. However, these technologies have created significant cultural issues around privacy, bias, and the need for a human face to be present in the process. Going forward, it will be important to establish good governance frameworks, ensure transparency of AI systems, and support on going research and development. The integration of AI and mental health services has the potential to improve services. While the benefits of intelligence are great, successfully sharing it requires ethics and responsibility. By addressing current challenges and anticipating future applications, we can harness .The power of AI to improve the accessibility, efficiency, and effectiveness of mental health care for individuals and communities.

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SMART RETAIL AI

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Abstract

The rationalization of the market layout of retail outlets for franchised goods is more specialized compared to ordinary goods. This paper proposes a novel evaluation model for retail outlet layout based on multi-objective optimization by leveraging data analysis and machine learning techniques. The entire area is divided into local sub-regions through two-step clustering based on the density of retail stores. Then, a multi-objective genetic algorithm is applied to determine the optimal retail outlet layout within each sub-region. These optimal sub-solutions are integrated to form a globally optimized layout. The methodology was tested using a real-world data set of tobacco retail stores in a city, demonstrating the model's capability to assess distribution rationality and offer improved layout solutions. The paper also provides a practical application approach for utilizing the optimized layout in retail site planning.

IMPACT OF AI IN DAILY LIFE

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Abstract

The pervasive integration of Artificial Intelligence (AI) in daily life has profoundly transformed the way we interact, work, and live. AI- powered technologies have become an integral part of our daily routines, from virtual assistants like Siri and Alexa that manage our schedules and tasks, to personalized product recommendations one- commerce platforms that influence our purchasing decisions. Moreover, AI-driven automation has increased efficiency and productivity in various industries, including healthcare, finance, and transportation, leading to improved outcomes and enhanced user experiences. However, this increased reliance on AI also raises important questions about job displacement, data privacy, and bias, highlighting the need for responsible AI development that prioritizes Human well-being, transparency, and accountability. The advent of AI has also given rise to the concept of smart homes, where intelligent devices and appliances learn and adapt to our habits and preferences. With AI-powered home automation systems, we can control lighting,

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temperature, security, and entertainment systems with ease, making our living spaces more comfortable, convenient, and energy-efficient. Moreover, AI-driven predictive maintenance can detect potential issues before they occur, ensuring our homes remain safe and secure.

Keywords—Artificial intelligence, Automation, AI Ethics, Healthcare

SMART PARKING SYSTEM

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Abstract

Parking congestion in urban areas is a growing problem, leading to increased traffic, fuel consumption, and wasted time. This project aims to develop an smart parking system that enables users to find, book, and optimize private parking spaces in real-time. The system leverages Artificial Intelligence (AI) and Machine Learning (ML) to predict parking availability, suggest optimal locations, and enable seam less navigation. The solution consists of a web and mobile application where private parking owners can list their spaces, and drivers can search for available parking near their destination. AI algorithms analyze real-time data, user behavior, and historical trends to provide smart recommendations. The system also integrates computer vision (for automated space detection) and dynamic pricing models to optimize parking costs.

By reducing the time spent searching for parking, this system enhance surbn mobility, minimizes traffic congestion, and promotes efficient space utilization. The project is developed using React.js (frontend), Node.js (backend), Mongo DB (database), Tensor Flow(AI models), and cloud services like Fire base/AWS for real-time updates. This AI-driven smart parking solution has the potential to revolutionize urban parking management, providing a cost-effective, time-saving, and scalable alternative to traditional parking systems.

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IMPLEMENTATION AND ANALYSIS OF AI-POWERED DEEPFAKE DETECTION USING TRANSFER LEARNING AND CONVOLUTIONAL NEURAL NETWORKS

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Abstract

Deepfake technology, — In recent months, free deep learning-based tools have made it easier than ever to create highly realistic face-swapped videos, commonly known as DeepFakes (DF). While video manipulation using visual effects has existed for decades, the advent of deep learning has drastically improved the realism of fake content and made the creation process accessible to the general public. These AI-generated videos pose a growing threat across media and communication. Although generating DFs is now a simple task using AI, detecting them remains a significant challenge. Training algorithms to accurately identify deepfakes is complex due to the subtle nature of manipulations. In this paper, we propose a deepfake detection method based on Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs). The CNN extracts spatial features from video frames, which are then processed by an RNN to learn temporal inconsistencies caused by deepfake generation techniques. We validate our approach using a large benchmark dataset of fake videos and demonstrate that our system achieves competitive results using a streamlined, effective architecture.

Keywords: Deepfake Video Detection, Convolutional Neural Network (CNN), Recurrent Neural Network (RNN), Temporal Inconsistencies, Fake Content Identification.

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A DEEP LEARNING BASED APPROACH FOR BLOOD CANCER DETECTION USING MOBILENET ALGORITHM

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Abstract

Blood cancer, particularly leukemia, continues to pose a significant threat to human health due to the complexities associated with its early detection and accurate classification. Conventional diagnostic methods rely heavily on manual inspection of microscopic blood smear images by trained pathologists, a process that is not only time-consuming but also prone to human error and variability in interpretation. To address this challenge, this proposed system presents an innovative and intelligent deep learning-based system for the automated detection of blood cancer using the MobileNet algorithm. The system leverages a lightweight yet powerful Convolutional Neural Network (CNN) architecture, MobileNetV2 optimized for real-time and resource-constrained environments. The model is trained using transfer learning on a labeled dataset of microscopic blood smear images, where cancerous and non-cancerous cell samples are distinguished with high precision. Image preprocessing techniques, such as noise reduction, normalization, and contrast enhancement, are applied to improve the visual quality and feature extraction capability. Key performance metrics, including accuracy, precision, recall, and F1-score, are used to evaluate the model's effectiveness. The lightweight nature of MobileNet allows seamless deployment across web and mobile platforms, supporting real-time decision-making in clinical and remote healthcare settings. This demonstrates the potential of deep learning and MobileNet in enhancing diagnostic accuracy, reducing the workload on medical professionals, and promoting accessible healthcare solutions. The system offers a scalable and cost-effective tool for early blood cancer detection, particularly in low-resource or underserved medical environments.

Keywords: Blood cancer detection, MobileNetV2, deep learning, convolutional neural networks (CNN), image classification, microscopic blood smear analysis, medical imaging, transfer learning, Flask API, healthcare AI, artificial intelligence in diagnosis, early cancer detection, lightweight neural networks, medical automation.

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ENERGY CONVERGENCE IN IoT BASED WIRELESS SENSOR NETWORKS USING PERVASIVE OPTIMIZATION PROBLEM

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Abstract

The Wireless Sensor Networks (WSNs) is an autonomous association of devices that that serves multiple applications in an on-demand matter. Energy efficiency (EE) is a vital demand in such networks that are impacted by the resource constrained nature of the nodes / devices. This problem is resolved by augmenting the energy efficiency features of wireless sensor networks, a pervasive optimization problem (POP) of energy convergence (EC) is introduced in this paper. The proposed method identifies the energy drain sue to application services with a minimum time-to-live feature. This feature ensures the availability of the least possible residual energy for the mobile devices preventing failures. The energy drain rate is estimated as a convergence for the maximum and minimum application support provided.

In this tenure, the failures and disconnections are identified to prevent early convergence. Such identifications are relies on IoT and blockchain resources re-allocation that prevents energy and service failures. The blockchain features independent node observations based on energy and convergence, without failing an entire network. Besides, the time lag of wireless sensor networks is balanced using IoT communication features. This optimization problem is aided by recurrent neural networks for repeated device monitoring and convergence estimation. The proposed method performance is analyzed using the metrics of energy utilization, convergence time, residual energy and delay.

Keywords: Convergence optimization, Energy Efficiency, IoT, Recurrent Neural Networks, Wireless Sensor Networks.

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THREE PHASES TRANSFORMER HEALTH MONITORING SYSTEM

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Abstract

The current scenario three phase transformer line health monitoring is major and important issue for phase voltage, phase current and transformer temperature level. In transmission line 85-87% faults of power system occur in this overhead Transformer. In this project, we discuss about various Method to control the fault generated in three phase transformer health monitoring and solve this in real time. The heart of this module is Arduino and embedded based software this will detect the fault and exact location of fault also which type of fault. It Will shows in display and software also be in this information is transmitted to the control room.

Keywords: health monitoring, Arduino & embedded based software

POWER THEFT DETECTION IN ENERGY METER USING ARDUINO

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Abstract

The Electrical energy has been considered as an essential form of energy. Whether it is Industrial need or household need, electricity is a must. Nowadays, with the increasing need for electricity, power theft is also increasing. This power theft is a severe problem like load scheduling will just become a hoax because of this Theft. Also, in developing countries like India, this power theft is 30%- 40% of total generated power and the electricity board has to provide this from their funds this results in major losses to electricity boards. This paper presents a way to detect power theft, alert the consumer, and cut off the supply accordingly. When unauthorized actions are detected, and a separate message is sent back to the microcontroller to remove the illegal supply, an SMS is sent automatically to the user via the

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GSM module. The GSM is interspersed with a unique system energy meter with a relay to handle the nontechnical losses, problems with billing, and variations in voltage fluctuations.

Keywords: detect power theft, GSM

IoT BASED UNDERGROUND CABLE FAULT DETECTION

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Abstract

This project proposes an IoT-based underground cable fault detection system for real-time monitoring and precise fault localization. It detects faults by measuring voltage variations and resistance changes using a microcontroller (Arduino/ESP32). When a fault occurs, such as a short circuit or open circuit, the system calculates the fault distance and transmits data via Wi-Fi/GSM to a cloud platform. A mobile or web application displays the fault location, while automated alerts notify maintenance teams, reducing downtime and costs. This smart, scalable, and efficient system improves underground cable network reliability and maintenance.

Keywords: IoT,Arduino/ESP32,Wi-Fi/GSM

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INTELLIGENCE AGRICULTURE MONTORING SYSTEM USING PLC AND IoT

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Abstract

The Smart agriculture uses modern technologies to boost farming productivity and efficiency. Programmable Logical Controller (PLC) is used in the automation of agricultural processes. This paper presents the functional block diagram logic for a PLC based smart agriculture system. The system integrates sensors to monitor field conditions in real time, allowing for intelligent decision-making regarding irrigation pumps, temperature control, moisture control, lighting management, nutrient dispensing, and seed and soil quality and warning alert when the animals enter near the crops, all of which are crucial to monitor as they may affect crop yield. The architecture of the system includes input sensors, a PLC interface, control logic, output actuators, and an Internet of Things (IoT) interfaced communication module for remote monitoring. This method attempts to communicate vital agricultural data to the relevant authorities and the farmer in an effort to maximize resource use, boost crop production, and lower labour expenses.

Keywords: PLC, IoT, irrigation pumps, temperature control, warning alert, lighting management, nutrient dispensing, seed and soil quality, moisture control.

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BIDIRECTIONAL WIRELESS POWER TRANSFER FOR VEHICLE-TO-VEHICLE (V2V) CHARGING WITH DONOR TRACKING SYSTEM

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Abstract

The rapid proliferation of electric vehicles (EVs) has underscored a critical need for accessible, flexible, and decentralized charging solutions, particularly in regions with limited charging infrastructure. This project presents a novel approach to address this challenge through the development of a Bidirectional Wireless Power Transfer (BDWPT) system for Vehicle-to-Vehicle (V2V) charging with donor tracking system, enabling direct, contactless energy exchange between EVs without reliance on fixed charging stations. The proposed system allows EVs to dynamically function as either Receiver EVs—vehicles requesting charge—or Donor EVs—vehicles supplying energy. The hardware implementation is based on Inductive Power Transfer (IPT) technology and integrates components such as high-frequency full-bridge converters, LCC compensation networks, power electronic switches, and dedicated controllers. Key innovations including adaptive coil alignment, resonant tuning, and phase shift control ensure high-efficiency energy transfer, even under varying alignment and proximity conditions. To validate the system's performance, extensive simulations are conducted using MATLAB/Simulink, focusing on current, voltage, power flow, switching behavior, and transient response. In parallel with the hardware, an intelligent, IoT-enabled web and mobile application is developed to manage and monitor the charging process in real-time.The application incorporates a secure, role-based user interface through which Receiver EVs can initiate energy requests, and Donor EVs receive notifications of nearby requests based on real-time geo location data. Donors can then accept or decline requests via an intuitive dashboard. Upon acceptance, a communication channel is established between the two vehicles, enabling safe, automated energy transfer. The system concurrently monitors key battery parameters—voltage, temperature, and current—and provides real-time updates to users, ensuring reliability and user awareness throughout the charging session. By combining advanced wireless power transfer mechanisms, IoT-based monitoring, and user-centric mobile/web interfaces, this project proposes a scalable, secure,

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and sustainable solution for on-demand EV charging. It effectively reduces dependency on stationary infrastructure, mitigates range anxiety, and fosters the evolution of a cooperative electric mobility ecosystem—paving the way for the next generation of intelligent transportation networks.

Keyword: IoT, MATLAB/Simulink, full-bridge converters, electric mobility ecosystem, user-centric mobile/web interfaces

DESIGN AND IMPLEMENTATION OF AN IoT ENABLED HYBRID POWER SYSTEM FOR ELECTRIC VEHICLES CHARGING

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Abstract

The increasing adoption of electric vehicles (EVs) has led to a growing demand for sustainable and efficient charging solutions. Traditional EV charging systems depend on external power sources, such as grid-connected solar and wind power plants, which face limitations related to infrastructure, availability, and transmission losses. To overcome these challenges, this project proposes an IoT-enabled self-charging Electric Vehicles that integrates solar and wind energy directly onto the vehicle. The system features solar panels mounted on the vehicle's roof and body to harness solar energy, complemented by a miniature wind turbine that captures airflow while the vehicle is in motion. A smart energy management system, incorporating MPPT charge controllers, optimizes power extraction and storage. Additionally, IoT-based real-time monitoring allows users to track energy generation, battery status, and efficiency through a mobile or web application. By minimizing dependence on external charging stations, this solution extends the driving range while promoting clean and sustainable energy use. This innovation offers cost savings, reduced carbon emissions, and enhanced convenience for Electric Vehicles users, contributing to the future of sustainable transportation.

Keywords: Hybrid Renewable energy, Electric Vehicles, IoT, Self-charging, Power systems.

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DESIGN AND IMPLEMENTATION OF AN UNMANNED NIGHT SURVEILLANCE ROBOT FOR COLLEGE CAMPUS SECURITY

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Abstract

The rapid advancements in emerging technologies have enabled the development of intelligent security solutions for campus safety. This project focuses on the design and implementation of an unmanned night surveillance robot to enhance security on college campuses. The proposed system integrates cutting-edge technologies such as artificial intelligence, IoT, computer vision, and real-time data processing to monitor and detect potential security threats. Equipped with night vision cameras, motion sensors, and autonomous navigation capabilities, the robot can patrol the campus during nighttime, identify unauthorized intrusions, and transmit live surveillance footage to a central security system. The integration of machine learning algorithms allows for anomaly detection and real-time alerts, ensuring immediate response to suspicious activities. Additionally, the system supports remote access and control, enabling security personnel to intervene when necessary. If any distressing voice, such as a call for help, is detected, the system will automatically send an alert to the authorized personnel, capture live video footage, and store it on the device for further investigation. By leveraging automation and smart surveillance, this project aims to provide a cost-effective and efficient solution for campus security, reducing human dependency while enhancing overall safety measures.

Keywords: Un manned Surveillance, Autonomous Robot Night Vision, Campus Security

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DESIGN AND IMPLEMENTATION OF IoT BASED FOOD QUALITY MONITORING SYSTEM

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Abstact

The IoT-Based Food Quality Monitoring System is designed to monitor and maintain the ideal environment for storing perishable food items. It uses renewable energy sources such as solar and wind to charge a battery, making it energy-efficient and eco-friendly. The power from the battery is regulated through an IC 7805 voltage regulator to supply the necessary voltage to the components. At the heart of the system is the ESP8266 Wi-Fi module, which controls and manages all operations. A DHT11 sensor is used to measure temperature and humidity in real-time. If the temperature exceeds a set limit, the ESP8266 activates a fan and Peltier cooling plates through Relay 1 and Relay 2, respectively. A voltage sensor continuously monitors the power level to ensure the system runs reliably. An LCD display shows live readings of the environment for on-site monitoring. Additionally, the system connects to Wi-Fi using SSID and password credentials. It receives an IP address and connects to the internet gateway. The collected sensor data is uploaded to a cloud platform like ThingSpeak. This allows users to access real-time food storage conditions remotely. The system provides alerts and helps prevent food spoilage. It is particularly useful in storage units, transport vehicles, and warehouses. With automated monitoring and control, it reduces manual effort and ensures better food safety. This project demonstrates a smart, sustainable, and efficient way to monitor food quality using IoT technology.

Keywords: Food Quality Monitoring, IoT

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DESIGN AND IMPLEMENTATION OF IoT-BASED SOLUTIONS FOR OPTIMIZING TRAFFIC CONDITIONS AND ENHANCING SMART CITY STREET LIGHTING

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Abstract

The rapid growth of urban populations has led to significant challenges in managing traffic congestion and ensuring efficient street lighting systems. The integration of Internet of Things (IoT) technologies offers promising solutions to address these issues, enabling smart cities to optimize traffic flow and enhance energy efficiency. This paper presents the design and implementation of an IoT-based system aimed at optimizing traffic conditions and improving smart city street lighting. The system utilizes real-time data collected from sensors embedded in roads, vehicles, and traffic signals to monitor and manage traffic patterns, reduce congestion, and minimize travel time. Additionally, smart street lighting is incorporated, using IoT-enabled sensors to adjust lighting intensity based on traffic flow, pedestrian activity, and environmental factors, thereby reducing energy consumption. The system leverages advanced data analytics and machine learning algorithms to predict traffic patterns and dynamically adjust traffic signals and street lighting. The proposed solution not only enhances the efficiency of urban transportation systems but also contributes to energy conservation, making cities more sustainable. The paper ,outlines a discussion on its impact on traffic management, energy savings, and overall urban development.

Keywords: IoT-enabled sensors, smart street lighting, traffic signals monitor

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DESIGN AND IMPLEMENTATION OF ADVANCE BLIND SPOT DETECTION AND COLLISION AVOIDANCE SYSTEM FOR TRUCKS

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Abstract

Blind spots in trucks pose a significant safety risk, often leading to collisions, especially in congested urban areas and highways. This project presents an Advanced Blind Spot Detection and Collision Avoidance System designed to enhance driver awareness and improve road safety. The system integrates computer vision, LiDAR, ultrasonic sensors, and AI-driven predictive analytics to detect objects in blind spots and assess collision risks in real time. Using strategically placed cameras, computer vision algorithms process video feeds, while LiDAR and ultrasonic sensors provide depth perception and proximity alerts. Additionally, a machine learning model analyzes driving patterns and environmental factors to predict potential collisions and trigger early warnings. When a risk is detected, the system generates visual, auditory, and haptic alerts, and in critical scenarios, it can activate semi-autonomous braking or steering assistance to prevent accidents. Real-time data is also transmitted to a cloud-based dashboard for fleet monitoring and predictive maintenance, ensuring enhanced safety and operational efficiency. By leveraging AI, IoT, and sensor fusion, this system aims to minimize blind spot-related accidents, improve driver response time, and revolutionize collision avoidance technology for heavy duty trucks.

Keywords: Integrates computer vision, LiDAR, ultrasonic sensors,AI-driven, IoT

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DESIGN AND IMPLEMENTATION OF SMART SOLAR POWER BANK WITH INTEGRATED WIRELESS CHARGING SYSTEM FOR REMOTE APPLICATION

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Abstract

The growing demand for sustainable and off-grid energy solutions has led to innovative approaches in renewable energy utilization. This project focuses on the design and implementation of a Smart Solar Power Bank integrated with a Wireless Charging System, specifically developed to meet the energy needs of home appliances in remote or off-grid locations. The system harnesses solar energy through photovoltaic (PV) panels, which convert sunlight into electrical energy. This energy is then stored in a rechargeable battery, ensuring continuous power availability even during periods of low sunlight. To manage and regulate the energy flow, a 7805 voltage regulator is used to maintain a stable output, while an Arduino Nano microcontroller functions as the central control unit. The microcontroller monitors voltage levels, controls switching elements like relays, and directs power to inductive charging coils that facilitate wireless power transfer (WPT) to end appliances. The use of inductive coupling eliminates the need for traditional wired connections, enabling wireless charging of common household devices such as fans and lights.This system not only simplifies energy distribution by reducing cable dependency but also enhances the portability, safety, and user convenience of solar power solutions. It integrates sensor-based automation (e.g., IR and voltage sensors), real-time monitoring through an LCD display and mobile app, and IoT features like web-based battery voltage visualization using Think Speak. These functionalities collectively contribute to a smarter, more efficient power management system. Designed with the challenges of rural and remote environments in mind, this project offers a reliable, eco-friendly alternative to conventional power systems, promoting the broader adoption of renewable energy technologies and supporting global sustainability goals. It demonstrates the potential of combining solar energy harvesting, embedded systems, and wireless charging to create a versatile and future-ready energy solution.

Keywords: solar power bank**,** IoT, Arduino, solar energy, WPT

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DESIGN AND IMPLEMENTATION OF AN IoT BASED ENERGY MONITORING SYSTEM IN THE SMART GRID

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Abstract

The growing demand for efficient energy management has led to the adoption of smart grid technology integrated with the Internet of Things (IoT). This paper presents an IoT-based Energy Monitoring System that optimizes energy generation, storage, and consumption by leveraging renewable energy sources such as solar power. The proposed system utilizes solar panels, voltage and current sensors, an ESP8266 Wi-Fi module, a DC-DC booster, a relay, and an inverter to enable real-time monitoring and control of energy flow.The IoT platform provides remote access, allowing users to track energy usage and make informed decisions to enhance efficiency. The system ensures stable energy distribution through automated controls, while smart grid integration minimizes energy wastage. The incorporation of touch sensors and an LCD display offers a user-friendly interface for energy management. By facilitating real-time insights and dynamic optimization of power consumption, this IoT-based system contributes to sustainable energy solutions for smart homes and industrial applications.This research highlights the effectiveness of real-time energy tracking, smart grid automation, and renewable energy integration in reducing dependence on conventional power sources. The results demonstrate enhanced energy efficiency, lower operational costs, and improved sustainability, making this solution a promising approach for future energy management systems.

Keywords: IoT, Smart Grid, Energy Monitoring, Renewable Energy, ESP8266, Real-time Monitoring, Solar Power, Automation.

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DESIGN AND IMPLEMENTATION OF SUBMARINE MOTOR FAULT DETECTION IN UNDER GROUND

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Abstract

The design and implementation of a submarine motor fault detection system for underground applications is a critical advancement in ensuring the safety, reliability, and operational efficiency of underwater and subterranean operations. This system aims to detect and diagnose faults in submarine motors in real-time, there by preventing potential failures that could lead to severe operational risks, downtime, and high maintenance costs. By integrating advanced sensor technologies, data analysis, and fault detection algorithms, the system is capable of continuously monitoring various parameters, including motor temperature, vibration, and electrical signals. Early detection of abnormal conditions allows for timely intervention and preventive maintenance, thus enhancing the overall performance and longevity of the motors. The implementation of this fault detection system offers a comprehensive solution to the challenges of maintaining submarine motors in demanding underground environments, ensuring both operational safety and cost-effectiveness.

Keywords: submarine motor, Electrical signals, Data analysis, fault detection algorithms

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DESIGN AND IMPLEMENTATION OF AN IoT BASED LIVESTOCK MONITORING AND MANAGEMENT SYSTEM USING MACHINE LEARNING ALGORITHM.

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Abstract

The design and implementation of a Livestock Monitoring and Management System using machine learning (ML) algorithms aims to improve the efficiency and productivity of livestock farming by automating the monitoring of animal health, behavior, and environmental conditions. The system integrates various sensors and IoT devices to collect real-time data such as temperature, humidity, location, movement patterns, and vital signs of the animals. Machine learning algorithms, including classification and regression techniques, are employed to analyze this data and detect anomalies, predict diseases, monitor feeding patterns, and optimize breeding practices. The system provides actionable insights to farmers, enabling timely interventions and informed decision-making, ultimately reducing costs, improving animal welfare, and enhancing farm management. The proposed system is scalable, user-friendly, and capable of providing continuous monitoring through a mobile interface, making it an essential tool for modernizing livestock farming and ensuring sustainable agricultural practices

Keywords: smart farming, smart feeding and nutrition management

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DESIGN AND IMPLEMENTATION VICTIM MONITORING ALERT SYSTEM FOR PARALYTIC DISABLED PEOPLE

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Abstract

The Victim Monitoring Alert System for Paralytic Disabled People is an innovative hardware-based solution specifically designed to assist individuals suffering from paralysis during emergency situations. These individuals often face significant challenges in communicating their needs or calling for help due to limited mobility and speech impairments. The proposed system addresses this by providing a fully automated and intelligent monitoring mechanism. The system integrates advanced sensors, cameras, and embedded processing units to continuously monitor the physical condition and environment of the affected person. It can detect abnormal situations such as unusual body postures, lack of movement, or other indicators of distress using sensors like tilt sensors, heart rate monitors, conductivity sensors, and temperature/humidity sensors.

The collected data is processed in real time using deep learning algorithms, allowing the system to distinguish between normal activities and emergencies with high accuracy. Upon detecting distress, alerts are automatically triggered via a Wi-Fi module (ESP8266), which communicates with a cloud platform like Think Speak. Alerts are then sent to caregivers or emergency responders through mobile notifications, ensuring rapid intervention. By removing the need for manual monitoring, the system reduces response delays and increases the chance of timely assistance. Its AI-based intelligent decision-making improves reliability and reduces false alarms. This system can be effectively implemented in homes, hospitals, rehabilitation centers, and public places. It enhances the quality of life for paralytic patients and offers peace of mind to their families and caregivers by ensuring their safety and well-being.

Keywords: Wi-Fi module (ESP8266), sensors, cameras, and embedded processing units

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VOICE OPERATED INTELLIGENT FIRE EXTINGUISHER VEHICLE

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Abstract

The Voice Operated Intelligent Fire Extinguisher Vehicle (VOIFEV) represents a significant advancement in firefighting technology, integrating voice recognition, automation, and intelligent systems to revolutionize fire response and management. The system is designed to enhance the efficiency, speed, and safety of fire extinguishing operations by enabling voice commands to control a fire extinguisher vehicle. This vehicle, equipped with cutting-edge sensors, artificial intelligence, and autonomous navigation capabilities, can rapidly detect fire hazards, assess fire severity, and autonomously deploy appropriate firefighting agents. The integration of voice-operated commands allows operators to control the vehicle and firefighting mechanisms without the need for direct manual intervention, thus reducing response time and minimizing human error during critical moments. The VOIFEV is capable of navigating through challenging terrains and reaching hazardous areas that may be difficult or unsafe for human firefighters to access, ensuring that fires are swiftly controlled. By leveraging the power of advanced technologies such as natural language processing and real-time decision-making algorithms, the vehicle can not only react to commands but also anticipate and adapt to changing fire conditions. This intelligent system thus provides a safer, more reliable, and efficient solution for combating fires, particularly in large-scale environments like industrial complexes, forests, or urban settings where quick and effective intervention is crucial. Through its combination of automation, artificial intelligence, and voice control, the VOIFEV promises to significantly improve fire management operations, reducing the risk to human life and property while increasing overall firefighting effectiveness.

Keywords: smart fire safety and live saving-innovation

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REAL-TIME FIRE DETECTION USING PRETRAINED MODELS FOR LOCATION PREDICTION

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Abstract

Fire Detection is crucial for ensuring the safety of both lives and property. This project presents a novel approach to real time fire detection using a pretrained model. The model named`fire_detection_cascade_model.xml`,is employed to identify the presence of fire in a webcam feed. To enhance the precision of detection and provide valuable information to responders, the webcam width is divided in to four parts A,B,C and D. When a fire is detected, the system indicates the specific area where the fire is located by identifying the corresponding section (A, B, C, or D). This information is displayed in the terminal, enabling quick and accurate response measures. The proposed system offers a cost-effective and efficient solution for fire detection, utilizing existing pretrained models. The division of the webcam feed into sections allows for localized information, aiding in better resource allocation and emergency response strategies. This project showcases the potential of pretrained models in addressing critical safetyconcerns, paving the way for futureadvancements in fire detection technology.

Keywords—DeepLearning, DigitalImageProcessing, PYCHARMSoftware.

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HOME AUTOMATION USING IOT BASED ON ETHERNET

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Abstract

In this paper, we proposed the proto type and design for implementation of new home automation technique, which uses Wi-Fi technology for a network infrastructure connecting its parts. This proposed system consists of two main components first one is the server (web server), which presents system core that monitors, manages and controls and users' home. System administrator and Users and can locally (LAN) or remotely (internet) manages and control system code. Second one is hardware interface module, which provides appropriate interface to the sensors and actuator of the home automation system. Unlike available home automation system available in the market the anticipated system is scalable that one server can able to manage lots of hardware interface modules as long as it exists on (Wi-Fi) network coverages. Some System supports a wide range of home automation procedure like power management components and the security components etc. The proposed system is better from the scalability and elasticity point of view than the commercially available home computerization systems.

Keywords: Home Automation, Power Management, Home Computerization Systems.

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ROOTS OF TRUTH: ML-POWERED INSIGHT INTO MEDICINAL PLANT AUTHENTICITY

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Abstract

Identifying medicinal plants using machine learning for authenticity and supply chain integrity faces multifaceted challenges. The diverse morphology of plants, limited availability of comprehensive image datasets, and intraspecific variability pose hurdles in training models to accurately discern between different species. Adulteration and contamination concerns require the inclusion of such scenarios in training data, ensuring the model's robustness. Environmental factors, including varying conditions during image capture, necessitate resilience in the model for consistent identification. The software employs advanced machine learning algorithms to analyze botanical images, extracting distinctive features and patterns to accurately identify various medicinal plant species.

Keywords: Medicinal plant identification, Machine learning, Adulteration detection, Image datasets, Species classification

SMART AND SECURED PATIENT HEALTH MONITORING SYSTEM USING IOT

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Abstract

In this paper, we proposed a device which will continuously monitor the vital parameters to be monitored for a patient and do data logging continuously. If any critical situation arises in a patient, this unit also raises an alarm and also communicates to the doctor via message. Here, We use a compact sensor which is used to monitor the heartbeat in analog form and to check the condition of the patient we required some more components such as thermometer and respiration Monitor, motion and heartbeat sensor so that simultaneously we can monitor the patient's condition. Itsecure data transmission and storage protocols protect sensitive patient information. Major Advantage of this methods is Remote monitoring can reduce the

cost of healthcare by minimizing the need for hospital stays and repeat visits. It also provides user-friendly application for healthcare professionals to access and monitor patient data.

Keywords: Data logging, Remote monitoring, User-friendly application.

A COMPARATIVE STUDY OF WI-FI 6 AND LIFI FOR FUTURE COMMUNICATION SYSTEMS

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Abstract

The rapid advancement of wireless communication technologies has become essential in meeting the ever-increasing global demand for faster, more reliable, and secure data transmission. As modern applications such as the Internet of Things (IoT), smart homes, industrial automation, augmented reality (AR), and high-definition streaming become more prevalent, traditional wireless standards face growing limitations in terms of bandwidth, latency, and network congestion. In this context, next-generation wireless technologies like Wi-Fi 6 (IEEE 802.11ax) and Light Fidelity (LiFi) have emerged as promising solutions to overcome these challenges.Wi-Fi 6 enhances the performance of conventional wireless networks by introducing features such as Orthogonal Frequency Division Multiple Access (OFDMA), Target Wake Time (TWT), and improved Multiple-Input Multiple-Output (MIMO) capabilities, allowing for better efficiency, speed, and power management. On the other hand, LiFi, which uses visible light for high-speed data transmission, offers advantages in terms of ultra-high bandwidth, inherent security, and reduced electromagnetic interference. This paper provides a comprehensive comparative analysis of Wi-Fi 6 and LiFi, focusing on their technical architectures, performance characteristics, application domains, and current limitations. Furthermore, it explores how these technologies can be integrated to complement one another, ultimately forming a hybrid communication infrastructure that is robust, scalable, and well-suited for future wireless ecosystems.

Keywords: Wi-Fi 6, LiFi, Hybrid communication infrastructure, Wireless communication systems, High-speed data transmission.

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SMART PRECISION AGRICULTURE SYSTEM

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Abstract

This project presents a **Smart Precision Agriculture System (SPAS)** designed to help farmers monitor and manage their fields more effectively using IoT and automation. The system uses multiple wireless sensor nodes placed in different parts of the farm. Each node checks important soil and environmental conditions like soil moisture, temperature, humidity, and sunlight. The data is sent to a central unit using LoRa communication, which then uploads the information to an online dashboard. Farmers can view real-time conditions of their land from their smart phone or computer, and they can also control the water pump remotely. The system also includes an AI-based crop recommendation feature, camera module and image recognition. An optional feature includes a camera module that can detect plant diseases or pests using image recognition. Weather forecast data is also used to plan irrigation schedules wisely and save water. This improved system is a step toward smart and sustainable farming that saves resources, increases productivity, and supports better decision-making. The system includes a smart feature that recommends the best crop to grow based on the current weather and soil conditions. It is solar-powered, so it works even in remote areas without electricity. An optional camera can also check plants for diseasesor pestsusing image detection. It also uses weather forecasts to avoid watering during rain, helping to save water.

Keywords: smart farming, image detection, lora communication

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ADVANCED VOTING SYSTEM WITH ENHANCED SECURITY

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Abstract

In our digital society, ensuring the integrity, security, and transparency of the voting process has become more critical than ever. This paper proposes an advanced voting system that leverages cutting-edge technologies to enhance the security and reliability of electronic voting. The system integrates biometric authentication, end-to-end encryption, and IOT technology using vast controller to preventing from offense voting, ensure voter unknown, and provide an immutable record of all votes cast. Additionally, real-time application features and multi-factor authentication protocols are implemented to maintain trust and transparency all things voting process. Scalability and reliability underpin the system's architecture, ensuring seamless operation during high-demand scenarios without compromising performance. Privacy preservation is addressed through cryptographic techniques that dissociate voter identity from ballots.

Keywords : IOT,Raspberry pi 5,biometricauthentication,voting machine

TINY ML AT THE EDGE: ENABLING SMARTER IOT THROUGH EMBEDDED INTELLIGENCE

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Abstract

This article provides a thorough review of the emerging concept of the Internet of Intelligent Things (IoIT), taking an integrated approach that focuses on embedded systems, edge computing, and machine learning. With rapid advancements in these areas, new solutions are emerging to address previously unresolved issues, necessitating innovative research and development strategies. In this regard, the article seeks to bridge significant research gaps, laying the groundwork for advanced studies based on the growing trend of embedded devices powered by compressed AI models. To achieve this, the article first

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explores the evolution of embedded devices and wireless communication technologies over recent decades, which has led to the rise of IoT applications across various fields. This analysis focuses on the development of practical solutions, recent research trends, and future outlooks. By offering a comprehensive review of the literature across all layers of the Internet of Intelligent Things paradigm, discussing potential applications, and proposing a new taxonomy to guide future development efforts, this article aims to provide a holistic view of this rapidly evolving and challenging research domain.

Keywords: Edge computing, compressed AI models, machine learning, Smart Device.

DESIGN AND IMPLEMENTATION OF REAL TIME LANDSLIDE MONITORING AND PREDICTION SYSTEM USING INTERNET OF THINGS AND MACHINE LEARNING TECHNIQUE

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Abstract

The goal of the proposed work is to develop an early flood detection and environment monitoring system utilizing IoT is to create a system that includes a sensor, a transceiver to transfer data, and a computing device to monitor and predict floods. In this system, we utilize the Lm35 sensor and an ultrasonic sensor. The Anemometer is used for wind speed calculation , LM35 sensor is employed to monitor soil moisture and temperature, while the ultrasonic sensor is used to monitor the water level in dams. The data collected from these sensors is stored on the ThingSpeak IoT platform and saved in a CSV file.In the next phase, this data, along with air speed, will be used to train a model using the Artificial Neural Network (ANN) algorithm. By leveraging ANN, various parameters such as weather conditions, soil moisture, water levels, and air speed will be analyzed to predict the likelihood of floods and landslides in real time. In addition to the data collection and analysis, the system will implement a user-friendly interface that allows stakeholders to monitor real-time sensor data through a web application. This interface will display critical metrics such as soil moisture levels, dam water levels, and environmental conditions, enabling users to visualize trends and potential risks. Alerts and notifications will be generated automatically when the

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sensor data reaches predefined thresholds, indicating possible landslide or flood events. By integrating IoT and ML technologies, this project aims not only to enhance situational awareness but also to empower decision-makers with predictive insights, thereby improving disaster preparedness and response strategies.

Keywords: Flood detection, ANN algorithm ,IOT cloud platform, machine Learning, Anemometer sensor .

DESIGN AND IMPLEMENTATION OF AUTOMATIC BRAKING SYSTEM & PEDESTRIAN DETECTION USING ARTIFICIAL NEURAL NETWORK ALGORITHM AND REGENERATIVE POWER GENERATION

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Abstract

To advance vehicular safety and optimize accident response, integrates several cutting-edge technologies. The system uses Pulse Width Modulation (PWM) for automatic braking system, which dynamically adjusts braking force based on real-time detection of obstacles such as pedestrian, dogs, cars, and bikes using ANN algorithm. This precise control minimizes collision risks by ensuring timely and effective braking. For comprehensive situational awareness, ultrasonic sensors are employed to detect the vehicle's surroundings from left to right, detecting obstacles and aiding in collision avoidance. If object is detected means it will capture the image and send to authorized person using SMTP protocol thought email alert. This mechanism harnesses the vehicle's kinetic energy, converting it into electrical energy during braking events. This regenerative energy can be stored and reused, thus enhancing energy efficiency and contributing to sustainable power usage within the vehicle system .This integrated approach combines adaptive braking, real-time monitoring, precise location tracking, and efficient energy recovery, creating a robust framework for enhancing safety and performance on the road.

Keywords: Automatic braking system, ANN algorithm, PWM control,SMTP protocol, regenerative power generation.

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IMPLEMENTATION OF ENERGY EFFICIENT IN UNDERWATER WIRELESS SENSOR NETWORK USING DEEP LEARNING

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Abstract

Underwater acoustic sensor networks (UWASNs) is an emerging technology, comprising of sensor nodes and autonomous underwater vehicles (AUVs), all working in a collaboration to sense various phenomenon, process digital information, store processed data and communicate among each other and base stations. In this project the performance of Reinforcement learning (RL) algorithms can dynamically select energy-optimal paths by adapting to environmental changes in underwater acoustic network environment using the Network Simulator 3(NS3) tool is analyzing. We used 40 nodes which includes the sensors in scuba divers and AUVs. The signal from the source is transferred in clusters, ensuring energy efficiency. We used performance metrics like packet delivery ratio, average end-to-end delay, throughput and energy consumption of the sensor nodes. By using the Deep learning algorithm, the speed of underwater Acoustic signal is predicted. The underwater parameters which includes the depth, temperature, salinity and pressure are used for predicting the speed of underwater signal transfer which adds as an advantage to our project. Thus energy efficient and a secure signal transfer in underwater is achieved.

Keywords: Energy Consumption, Underwater, Reinforcement Learning , Malicious Node, Throughput, Packet Delivery, Deep learning.

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DESIGN OF EFFICIENT ENERGY STORAGE SYSTEM TO INTEGRATE RENEWABLE ENERGY SOURCE TO SUPPORT IN GRID

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Abstract

The proposed work addresses the modeling, control, energy management and operation of hybrid grid connected system with wind-PV-Battery Energy Storage System (BESS) integrated with Fuel Cell (FC) and Electrolyzer. A hybrid PV-Wind-FC with electrolyzer consisting of BESS with the least number of control loops and converters has been proposed. The proposed hybrid system presents a cost-efficient solution for integrating PV into a hybrid system by eliminating the PV converter. This includes the design of controllers for grid-connected hybrid systems with a renewable distributed generator (Wind and PV) as a primary source, BESS as a secondary source and FC with Electrolyzer as a tertiary source. In addition, the lead compensator along with integrator is used for obtaining enough phase margin and removing steady state error completely. It increases the stability of the controller and adds phase shift ϕsat a cross-gain frequency (ωcut).

The Grid Side Controller (GSC) is capable of providing frequency support to the utility grid, when it is linked to the grid. In the proposed configuration, PV power is maximized and injected into grid through GSC. Rotor Side Converter (RSC) and GSC ensure the support for sharing the burden of the grid station. Moreover, the proposed controller of BESS with coordination of FC eliminates the effect of intermittency of power generated from wind and PV. Excess power production by renewable distribution generation is used by Electrolyzer to generate hydrogen. This hydrogen is further used by FC when there is not enough power generation due to unfavorable weather conditions. The energy management has been presented to fulfill the load profile, avoid BESS overcharging and to minimize the intermittency and fluctuation of Wind and PV sources. This method guarantees steady power flow and service continuity.

Keywords: Grid connected system, Energy management system, Battery energy storage system, Electrolyte, fuel cell, Doubly fed induction motor, Maximum power point tracking.

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DESIGN AND IMPLEMENTATION OF FISHERMAN BORDER ALTER SYSTEM USING LORA COMMUNICATION.

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Abstract

Fishing is one of the most dangerous professions globally due to risks like drowning, vessel malfunction, and limited communication while at sea. Traditional safety methods such as VHF radios and satellite communications are either limited in range or prohibitively expensive for small-scale fishermen. This project presents a novel LoRa (Long Range) frequency communication-based safety and security system aimed at providing a cost-effective and reliable alternative for fishermen. The system integrates multiple components such as LoRa modules, GPS, and essential environmental sensors (gas, rain, etc.) into a waterproof, compact device mounted on fishing vessels. It ensures real-time tracking, environmental monitoring, geofencing, and emergency alerting, all supported through the LoRaWAN protocol, which is known for its long-range, low-power wireless communication capabilities. Through these features, the system offers continuous communication between fishermen and shore-based authorities, even in areas with limited or no GSM coverage. A key advantage of this system is its ability to send emergency alerts and voice messages during critical conditions, drastically reducing response time in rescue operations. The system is easily integrable with current infrastructure and supports features such as automated vessel identification and environmental condition sensing (e.g., gas leaks, rainfall). The hardware includes Arduino Uno microcontrollers, LoRa transmitters, LCDs for local display, and specialized sensors, all programmed via the Arduino IDE

Keywords: LoRaWAN, Fishermen Safety, Real-Time Tracking, Emergency Alert System, GPS Monitoring, Arduino, IoT in Marine, Environmental Sensors, Low Power Communication, Smart Fishing, Geofencing, Marine Security.

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DESIGN AND IMPLEMENTATION OF MODULAR AND COMPACT MILK QUALITY TESTING AND VENDING SYSTEM.

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Abstract

Milk is a widely consumed essential commodity, and ensuring its quality before distribution is crucial for public health and consumer satisfaction. Traditional milk vending systems lack real-time quality assessment, making them prone to contamination and adulteration issues. This project presents the design and implementation of a modular and compact milk quality testing and vending system that ensures both safety and convenience in milk distribution. The proposed system integrates multiple sensors to test essential milk parameters such as temperature, pH level, density, and water content. These parameters are evaluated in real-time to ensure the milk meets safety and quality standards. The compact and modular design allows for easy installation and maintenance in rural as well as urban areas. Once the milk passes the quality checks, it is made available for vending. The system uses a user-friendly interface, digital payment options, and automatic dispensing mechanisms to ensure hygienic and contactless delivery.

The vending unit is also connected to a central server or cloud platform for data logging, remote monitoring, and system updates. This solution not only improves the reliability and transparency of milk distribution but also empowers consumers with quality assurance. It has potential applications in dairy farms, milk collection centers, and automated kiosks, especially in areas where manual testing and distribution are inefficient or impractical.

Keywords: The proposed system integrates multiple sensors to test essential milk parameters such as temperature, pH level, density, and water content. The vending unit is also connected to a central server or cloud platform for data logging, remote monitoring, and system updates.

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DESIGN AND IMPLEMENTATION OF OPENCV-ENABLE ALZHEIMER'S ASSISTANCE USING EMBEDDED SYSTEM

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Abstract

This project introduces an advanced Alzheimer's assistance system that integrates computer vision with embedded technology to enhance patient safety and provide real-time monitoring. The heart of the system is an Arduino Uno microcontroller, which interfaces with various sensors, including a vibration sensor that detects falls or periods of inactivity. In addition to the sensor-based monitoring, the system leverages OpenCV for visual recognition, enabling the detection of facial expressions or movements that may indicate distress, further enhancing the system's ability to assess the patient's condition. The Arduino processes these inputs, ensuring that any signs of distress or emergency are met with immediate action, such as sending the patient's GPS coordinates to a designated caregiver.

To promote ongoing communication and verify the patient's safety, the system employs an LCD display that prompts the patient every 15 minutes to confirm their well-being by pressing a button. In the case of non-intervention or failure to address the situation, the system automatically escalates the alert to local authorities, ensuring that the patient receives timely assistance. By combining sensor data and visual recognition capabilities, this embedded system provides continuous monitoring, delivering rapid responses to any potential health risks or emergencies. This integrated solution offers a comprehensive approach to Alzheimer's patient care, promoting safety and peace of mind for both the patient and their caregivers.

Keywords: Open CV, GSM module and Vibration sensor.

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DESIGN AND IMPLEMENTATION OF ARDUINO-CONTROLLED WIRELESS CHARGING NETWORK FOR ELECTRIC VEHICLES ASSISTANCE USING EMBEDDED SYSTEM

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Abstract

This project proposes a smart charging system aimed at optimizing the utilization of energy resources in vehicles. An Arduino Uno microcontroller, acting as the central processing unit, interfaces with various sensors, primarily a DC voltage sensor linked to a 12V battery. Continuously monitoring the battery's voltage level, the system detects when the battery is nearing depletion. At this juncture, the driver can trigger a request for charging assistance by pressing a designated push button. Upon activation, the system employs a ZigBee module to transmit the request to nearby vehicles equipped with compatible receivers. The recipients are then prompted to respond to the request through a real-time IoT webpage.

Once a nearby vehicle accepts the request, acknowledgment status is relayed back to the initiator, informing them of the successful arrangement. This innovative system leverages IoT technology to foster efficient communication and collaboration among vehicles, enabling timely assistance in critical situations. By facilitating seamless interactions between drivers and their surrounding environment, the proposed solution aims to enhance overall energy management and ensure uninterrupted mobility, thereby promoting sustainability and convenience in the realm of vehicular operations.

Keywords: Wireless Charging, Electric Vehicles, Arduino Uno, Inductive Power Transfer

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DESIGN AND IMPLEMENTATION OF AUTOMATED CLASSIFICATION OF RECYCLABLEPLASTIC BOTTLES USING AI ASSISTANCE USING EMBEDDED SYSTEM

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Abstract

Plastic waste management is a critical challenge in environmental sustainability, with increasing plastic consumption contributing to pollution. Traditional waste sorting methods rely heavily on human labor, making the process inefficient and error-prone. This study proposes an Al-driven automated classification system for recyclable plastic bottles, leveraging advanced deep learning techniques to enhance sorting accuracy. The system integrates Convolutional Neural Networks (CNNs) and Ensemble Learning (EL) to accurately classify plastic bottles based on their transparency and recyclability. We developed a hybrid model combining Inception V3 and EfficientNet to improve classification accuracy and computational efficiency.

Data preprocessing techniques, including image augmentation and noise reduction, were applied to address dataset imbalances and enhance feature extraction. The proposed system is trained on an extensive dataset of plastic bottle images, distinguishing between highly recyclable transparent bottles and low-grade plastics. Our ensemble model achieved an accuracy of 99.85%, surpassing traditional classification methods. The system is designed for real-time deployment in waste management facilities, utilizing Al-powered vision systems for automated sorting. This approach significantly reduces manual labor, increases recycling efficiency, and minimizes environmental impact. By integrating Al into recycling processes, this research contributes to the development of smart waste management solutions, promoting sustainability and pollution control.

Keywords: AI (ArtificialIntelligence), Machine Learning, Image Recognition, Object Classification, Recycling Automation, Waste Sorting, Image Detection, CNN, Plastic Bottle Classification.

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DESIGN AND IMPLEMENTATION OF LOW POWER TURBO CODED SMART HEALTH MONITORING SYSTEM.

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Abstract

In this paper, we propose a low-power Turbo encoder and decoder architecture based on the 3GPP standard, optimized for Narrowband Internet of Things (NB-IoT) applications. By leveraging the Max-Log-MAP decoding algorithm and an improved recursive interleaving scheme, we achieve significant reductions in dynamic and logic power consumption. To demonstrate real-world applicability, the proposed codec is integrated into a Smart Health Monitoring System (SHMS), where energy efficiency is critical for wearable and remote medical devices. Our Verilog HDL implementation on FPGA shows a dynamic power consumption of less than 50 mW, representing a 40% improvement over prior designs. This integration enables long-term, reliable physiological data transmission for SHMS, supporting extended device lifespans and robust communication in constrained environments. The proposed design offers a scalable, low-latency solution suited for future e-health and remote patient monitoring platforms.

Keywords: Turbo encoder, Max-Log-MAP decoder, NB-IoT, smart health monitoring system, low power, interleaver optimization, wearable devices.

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DESIGN AND IMPLEMENTATION OF SIGN LANGUAGE TO SPEECH AND TEXT TRANSLATIONASSISTANCE USING EMBEDDED SYSTEM

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Abstract

This project aims to develop a system that translates sign language into audible speech and visual text, enhancing communication for individuals with hearing impairments. The system leverages Python and machine learning techniques to identify hand signs through a camera. Once a gesture is captured by the camera, it is processed in real-time by the trained machine learning model, which identifies the corresponding sign language symbol or word. The identified text is then immediately displayed on an LCD screen, providing instant visual feedback for the user and others nearby. This visual output is particularly helpful in environments where audible communication might be impractical or where additional confirmation is required.Using a trained model, the captured gestures are processed in real-time, converting them into corresponding text. This text is then displayed on an LCD screen for visual feedback. Additionally, the system utilizes a speaker to audibly translate the identified sign into speech, allowing for a seamless interaction between the user and the environment. By integrating computer vision and text-to-speech technologies, this project facilitates an accessible and intuitive method of communication, bridging the gap between sign language users and non-sign language speakers**.**

Keywords: Sign Language, Machine Learning, Computer Vision, Text-to-Speech.

ISBN: 978-93-48505-24-8

DESIGN AND IMPLEMENTATION OF A SMART AGRICULTURE MONITORING AND MANAGEMENT SYSTEM USING IOT-ENABLED DEVICES BASED ON LORAWAN.

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Abstract

Agriculture is undergoing a technological shift towards Intelligent Agriculture (IA) or Agriculture 4.0, driven by innovations like the Internet of Things (IoT), Unmanned Aerial Vehicles (UAVs), cloud computing, and Artificial Intelligence (AI). This paper introduces a novel framework designed to enable secure, efficient, and intelligent data sharing within smart agriculture ecosystems.At its core, the proposed system addresses critical issues such as data security, scalability, and real-time decision-making. A deep learning-based Intrusion Detection System (IDS) is deployed, utilizing a hybrid model that integrates a Contractive Sparse Autoencoder (CSAE), Gated Recurrent Unit (GRU), Multilayer Perceptrons (MLPs), and a Softmax classifier. This configuration effectively detects cyber threats with high accuracy and robustness, outperforming traditional machine learning techniques, as validated on the CICIDS-2017 dataset.In conclusion, this framework provides a secure, scalable, and intelligent architecture for smart agriculture, enabling precise monitoring and improved productivity. Future directions include enhancing scalability, real-world deployment, and integrating federated learning and edge computing.

Keywords: Smart Agriculture, Internet of Things (IoT), Deep Learning (DL), Intrusion Detection System (IDS), , Proof of Authority (PoA), InterPlanetary File System (IPFS Aerial Vehicle), Secure Data Sharing, LoRaWAN, Cybersecurity, Cloud Computing, Edge Intelligence.

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DESIGN AND IMPLEMENTATION OF AN IOT-BASED ELECTROCUTION HAZARD MONITORING AND CONTROLLING SYSTEM USING LORAWAN

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Abstract

Electrical shock and static discharge are common yet critical hazards in both residential and industrial environments. This project aims to develop a smart and efficient electrical fault monitoring and protection system using Arduino and LoRa technology. The system is designed to sense static charges or abnormal electrical conditions such as voltage fluctuations, short circuits, and line disconnections, and respond in real time to prevent damage to both equipment and human life.At the core of the system is an Embedded C program running on the Arduino microcontroller. The transmitter unit consists of a voltage sensor, comparator circuit, and an Arduino board. It continuously monitors the voltage level of the connected circuit. This signal is read by the Arduino, which activates an LED indicator and transmits the fault data via a LoRa module.

LoRa (Long Range) communication is chosen for its ability to transmit data over several kilometres with low power consumption. On the receiver side, another Arduino board equipped with a LoRa module receives the transmitted signal. Once the fault data is decoded, the Arduino processes it and activates a relay circuit to disconnect the load from the power supply, ensuring user safety and equipment protection. The proposed system offers several benefits such as automatic fault detection, long-range wireless communication, quick response time, and low-cost implementation. It is scalable, energy-efficient, and can be extended to multiple zones or circuits, making it ideal for modern smart energy systems. This project not only enhances electrical safety but also supports preventive maintenance and remote fault diagnostics.

Keywords: Arduino, LoRa Communication, Fault Detection, Static Discharge, Wireless Monitoring, Voltage Sensor, Embedded C, Relay Control, IoT Integration.

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DESIGN AND IMPLEMENTATION OF BIOMETRIC ATTENDANCE SYSTEM WITH MULTISENSORY INTEGRATION USING RASPBERRY PI

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Abstract

This paper is presented about a system of recording student attendance using fingerprint identification that allows students to monitor student attendance to class is a true electronically. It can reduce the presence of fraudulent students who are now mostly done by the students and the system can also reduce problems such as the presence of the missing paper and easily damaged. With this system can replace the existing manual system to a more systematic and electronics. This attendance system will be displayed on a computer lecturer with more attractive and graphics and have students complete detail using Microsoft Visual Basic Studio and integrated using the Fingerprint Reader.

Keywords: Biometric Attendance, Raspberry Pi, Fingerprint Sensor, Temperature Sensor, Alcohol Detection, Smoke Sensor

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DESIGN AND IMPLEMENTATION OF EMPOWERING EDUCATIONAL INSTITUTION ENTRANTS WITH CAMPUS NAVIGATION ROBOT

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Abstract

This project seamlessly integrates an ESP32, ESP8266 and Bluetooth module to develop a College Admission and Circular Robot System, combining robotics, IoT, web interaction, and voice-based control for an enhanced user experience. The ESP32 functions as the central controller, managing a robotic chassis with four DC motors for movement in forward, backward, left, and right directions, controlled by two motor drivers. The Adafruit IoT interface presents users with three functional buttons: Admission, Circular, and Departments. Upon pressing the admission button, users are redirected to a keypad on the IoT website to enter subject marks. The ESP32 calculates the cutoff and displays the department availability in an information box. If the desired department is unavailable, the system notifies the user of placement on the waiting list. Pressing the Circular button commands the robot to autonomously navigate towards the selected department's circular sheet, ensuring efficient access to college updates.

Similarly, activating the Canteen button directs the robot towards the canteen, assisting users in reaching their destination.After completing its assigned task, the robot autonomously returns to its starting position. In addition to web and voice controls, the Bluetooth module offers an alternative control mechanism, allowing users to maneuver the robot via a mobile application when necessary.By integrating IoT, Bluetooth communication, voice recognition, and robotics, this innovative system streamlines the college admission process, provides convenient access to circulars, and facilitates movement to the canteen. The combined functionality of web-based controls, voice-activated commands, automated navigation, and mobile-based manual control makes this system highly adaptable and user-friendly, enhancing overall campus navigation and accessibility.

Keywords: ESP32, ESP8266, Bluetooth, IoT, Adafruit, Obstacle Detection, Robotics, College Admission, Circular Access, Campus Navigation.

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DESIGN AND IMPLEMENTATION OF AUGMEMTED BASED INCUBATOR MONITORING SYSTEM

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Abstract

This project presents an advanced incubation system integrating IoT and Augmented Reality (AR) technologies to provide real-time monitoring and control of critical environmental and health parameters. The Arduino Uno serves as the central controller, interfacing with a DHT11 sensor for temperature and humidity measurement, a gas sensor for monitoring gas concentrations, and a heart rate sensor to track pulse activity. Additionally, an SpO2 sensor evaluates blood oxygen saturation to assess hemoglobin oxygen levels. An ESP8266 IoT module ensures seamless data transmission to the cloud, enabling remote accessibility and real-time updates. Augmented Reality, developed using Unity 3D and powered by Python programming, offers an intuitive interface for users to visualize and interact with sensor data in an immersive environment. This integration of AR enhances the understanding and management of the incubation system by providing dynamic 3D representations of critical parameters. The system is designed to ensure precise environmental control and health monitoring, making it applicable for medical, research, and controlled environment use cases. By combining IoT-based automation with AR-driven visualization, the project demonstrates a comprehensive approach to improving operational efficiency, user engagement, and data accessibility in advanced incubation systems, ultimately pushing the boundaries of smart monitoring technology.

Keywords: IoT, Augmented Reality, Arduino Uno, Real-Time Monitoring, Incubation System, Unity 3D, Environmental Control, Smart Health Monitoring, SpO2, DHT11.

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DESING AND IMPLEMENTATION OF SMART WIRELESS NOTICE BOARD

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Abstract

The Notice boards are playing a very important role in our day to day life. By replacing conventional analog type notice board with digital notice board we can make information dissemination much easier in a paperless community. Notice board could be a primary factor in any establishment or public places like bus stations, railway stations, colleges, malls etc. Sticking out numerous notices day to day could be a tough method. A separate person is needed to take care of this notice display. The objective of our project is to design a dot-matrix moving message display using microcontroller and wireless communication where the characters shift from left to write continuously. we have used 16 x 64 dot-matrix display. At first a code was developed. And we got our desired result there. This project is regarding advanced wireless notice board. In wireless communication based Web Controlled Notice Board, Internet is employed to wirelessly send the message from Browser to the LED display. The main objective of the project is to develop a wireless notice board that displays messages sent from the user's android application.

Keywords: Digital notice board, wireless communication, dot-matrix display, microcontroller, web controlled display, Android application, moving message display, paperless communication, internet-based system, real-time message update, smart notice board, remote access, LED scrolling display, IoT, embedded system.

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DESIGN AND IMPLEMENTATION OF AUTOMATED SOLAR PANEL CLEANING SYSTEM USING IOT

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Abstract

The Automated Solar Panel Maintenance System is an advanced solution designed to optimize the efficiency of solar panels by addressing the challenges posed by dust and atmospheric moisture. Utilizing embedded system technology, this robust system integrates smart sensors, automated cleaning mechanisms, and continuous monitoring to ensure the panels remain clean and functioning at peak performance. By autonomously detecting and removing contaminants, the system not only enhances energy output but also reduces the need for manual maintenance, thereby lowering operational costs and increasing the overall lifespan of the solar panels. This innovative approach promises to significantly improve the reliability and sustainability of solar energy installations, making it a valuable addition to the renewable energy landscape.

Keywords: Automated Solar Panel Maintenance, Embedded System, Smart Sensors, Solar Panel Cleaning, Energy Efficiency, Autonomous System, Dust and Moisture Detection

DESIGN AND IMPLEMENTATION OF A SMART HELMET FOR RIDERS SAFETY TO AVOID ACCIDENTS USING IOT.

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Abstract

Road accidents are a major cause of fatalities, highlighting the need for enhanced rider safety systems. This project introduces a Smart Helmet designed to prevent accidents

and provide immediate assistance during emergencies. The helmet features an axis sensor that monitors the rider's head position, detecting abnormal tilts at 180 degrees, which indicates a potential fall. Upon detecting a fall, the system calculates the impact force and sends an SMS alert with the rider's GPS location using a GSM module. An alcohol sensor is integrated to prevent drunk driving by disabling the vehicle's ignition if alcohol is detected in the rider's breath. A speed monitoring system alerts the rider with a buzzer and LED indicator if the speed exceeds a safe limit. Solar panels are installed to power the helmet, ensuring continuous operation without external power sources. This smart helmet combines real-time monitoring, automated alerts, and accident prevention, providing a comprehensive solution for rider safety and comfort.

Keywords: Bluetooth, RF modules, Zigbee, LoRa, NFC, FM transmitters, infrared (IR), and ultrasonic communication.

DESIGN AND IMPLEMENTATION OF SWITCHABLE UNMANNED AERIAL MANIPULATOR SYSTEM FOR AGRICULTURE USAGE

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Abstract

This study presents a development of Switchable Unmanned Aerial Manipulator System (SUAMS) specifically engineered for advanced crop management in precision agriculture. The system is designed to combine aerial mobility, enabling both autonomous navigation and interactive crop handling tasks such as targeted pesticide application, and plant health inspection. A key feature of the SUAMS is its mode-switching capability, allowing it to dynamically transition between stable flight and manipulation states without compromising system balance or control fidelity. The aerial platform is equipped with a multi-degree-of-freedom manipulator arm, integrated through a custom-designed control system that employs sensor fusion, inertial measurement, and real-time kinematic (RTK) GPS for high-precision operations. An onboard vision system, powered by deep learning algorithms, enables real-time crop analysis and precise object localization for interaction. The

manipulator control is synchronized with the UAV flight controller ensuring coordination between locomotion and manipulation tasks.

Keywords: Switchable Unmanned Aerial Manipulator System(SUAMS), Precision agriculture, Sensor fusion, Plant health inspection ,Real-time crop analysis ,UAV flight controller

DESIGN AND IMPLEMENTATION OF CHARTING A SECURE PATH FOR WOMEN'S SAFETY THROUGH ADVANCED CLUSTERING ASSISTANCE USING EMBEDDED SYSTEM

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Abstract

Women's safety remains a critical concern in urban and semi-urban environments, demanding innovative technological interventions. This study presents the design and implementation of a smart system aimed at charting secure routes for women using advanced clustering techniques. The proposed system integrates real-time crime data, user-generated reports, and location-based services to assess the safety index of different geographic zones. Leveraging unsupervised machine learning, particularly density-based clustering algorithms like DBSCAN, the system identifies high-risk and low-risk areas by grouping data points with similar safety attributes.

The platform dynamically generates the safest path between two points by avoiding clusters with high incident density, while incorporating user preferences such as lighting, public presence, and surveillance availability. A mobile application interface enables users to access real-time path recommendations, send emergency alerts, and contribute to safety mapping. The implementation is validated through simulations using public datasets, demonstrating significant improvement in route safety compared to traditional shortest-path algorithms.This research contributes to smart city safety infrastructure by offering a data-driven, user-centric approach to urban navigation, empowering women with information and tools to make informed travel decisions.

Keywords: Women's Safety, Clustering Algorithms, Safe Route Mapping, Crime Data Analysis.

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A REVIEW ON PROXIMATE ANALYSIS OF SOLID BLEND BIOMASS: ADVANCING SUSTAINABLE ENERGY SOLUTIONS

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Abstract

The rapid depletion of fossil fuel reserves and increasing awareness of environmental issues made it necessary to explore and adopt sustainable energy sources. Solid composite biomass is among the most promising substitutes in the realm of renewable energy. This source of energy offers an environmentally friendly solution while simultaneously providing an effective way for waste management. Proximate analysis plays a major role in determining the quality and sustainability for energy production of solid composite biomasses. This analytical method helps in assessing key parameters such as ash and moisture content, volatile matter, and fixed carbon content of solid biomass. Understanding such characteristics of biomasses is essential to optimize the application and improve its efficiency as a renewable energy source. The paper narrates a comprehensive review on the effect of composite blending of different biomass feedstocks on proximate analysis. The study demonstrates that the optimal blend can reduce ash formation and enhance the overall combustion performance, making the biomass a more efficient biofuel. The adoption of such sustainable energy sources can play a vital role in reducing dependence on fossil fuels while promoting an eco-friendly approach to energy production.

Keywords: Fossil fuel, Environmental issues, Proximate analysis, Biomass, renewable energy.

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REVIEW ON TORREFACTION TECHNIQUES APPLIED TO SOLID BIOMASS

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Abstract

Recently the production of energy or fuel from solid composite biomass prepared from natural feedstock or bio-waste materials has attracted attention in renewable energy for global interest. However, heterogeneous nature and undesirable properties of the natural solid composite biomass such as low bulk density, high moisture content, decreased energy density, can be overcome using torrefaction technique, a promising pre-treatment process. Torrefaction is a moderate pyrolysis process that is conducted in an inert condition at 200-300 °C. Utilizing torrefied biomass in co-firing power plants can alter its mechanical and chemical properties, including C/O and C/H ratios, ignition, grindability, combustion characteristics, and energy density. The paper narrates a comprehensive review of the most current research work on torrefaction technique. This review study discusses the impact of several solid composite biomasses on proximate and ultimate analysis and energy consumption. The review paper establishes that the fossil fuels can be partially replaced by the use of such torrefied solid biomass.

Keywords: Biomass, bio-waste materials, Renewable energy, Torrefaction technique

AGRICULTURAL ROBOT FOR SPRAYING AND TRIMMING

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Abstract

This project aims to develop a remote-controlled sprayer cum grass cutter to assist farmers in reducing manual labor and improving efficiency. The system integrates a sprayer for irrigation, pesticide or fertilizer application and a grass cutter for weed management. It operates on a battery-powered system and is controlled remotely via Bluetooth technology. This innovation enhances agricultural practices by minimizing human

effort and ensuring precise application. The system integrates microcontrollers, sensor, and wireless communication to enable remote and automation of a spraying and grass-cutting processes. Using IOT technology, framers can monitor and control the device through a mobile application, optimizing resource usage and minimizing human intervention. The proposed system enhances operational efficiency by uniform spraying and increased productivity. It reduce labor cost and dual functionality.

Keywords: Remote-controlled sprayer, Farmers, Fertilizer application, IOT technology

DESIGN AND FABRICATION OF INTERACTIVE AI BASED MECHANICAL SKULL

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Abstract

This project presents the design and fabrication of an interactive mechanical skull, ever aging advanced 3D printing technology to create a highly creative and functional final year project. The skull is designed to mimic human cranial movements, offering a compelling blend of anatomical accuracy and mechanical innovation. Through the integration of actuators and sensors, the skull responds to external stimuli, making it interactive and engaging. The use of3D printing allows for precise and customizable fabrication, ensuring the final product is both aesthetically appealing and mechanically robust. This project not only showcases the potential of 3D printing in creative engineering applications but also serves as a platform for exploring the intersection of art and technology in mechanical design. The mechanical skull will incorporate sensors and actuators to demonstrate various cranial movements and functions, such as jaw articulation and brain protection mechanisms. AI algorithms will enable real-time interaction, allowing users to ask questions and receive detailed explanations about anatomical components and their signi.

Keywords: Interactive design, Artificial engineering, Mechanical engineering, Robotics, 3D modeling, Sensors and actuators, Human machine interaction.

ISBN: 978-93-48505-24-8

SOLAR POWERED AUTOMATED THERMOPHILIC COMPOSTER

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Abstract

The waste management is very important thing or task to control and reduce amount of waste. And composting has been acknowledged as a main stay for the proper waste management. There are compost bins and that are worked on electricity. But the only problem we might face is its cost and increase in electricity bills. To prepare nutrient-rich matter from organic waste, it comes with its own set of problems—unbearable smells, slimy ingredients, and the decomposition process of organic matter. For this, we have an idea to innovate a much-needed solution. The "SPATCO - Solar Powered Automated Thermophilic Composter" will be definitely a great work got proper waste management at educational institutions and commercial establishments like schools, colleges, supermarkets, and restaurants. The aim of this project is to enhance the sustainability by making it easier and cheaper and enabling the user to interact with it as well as making the entire process user friendly. And the parameters like temperature, humidity as well as moisture are also controlled by automation. The problem of increased in electricity bills is overcome, as this composter is totally worked on solar power supply. Also the 'Solar Powered Automated Thermophilic Composter' will enhance the public health as well as health of soil by producing high quality compost.

Keywords; Solar power, SPATCO, Thermophilic Composter, powersupply.

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PEST PREDICTION SENSOR WITH DRIP IRRIGATION

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Abstract

This project proposes the development of an innovative pest prediction sensor integrated with a drip irrigation system. The sensor used advanced machine learning algorithms to predict pest infestations in real time, enabling farmers to take proactive measures. The system also optimizes water usage through precision drip irrigation, reducing waste and minimizing the environmental impact.

Keywords; Pest prediction, Sensor, Farmers.

MECHANICAL CHARACTERISTICS AND APPROPRIATE RATIOS OF GRANITE-RELATED MATERIALS WITH DIFFERENT WEATHERING LEVELS

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Abstract

The mechanical properties of artificial substances wanted to resemble granite at different weathering stages are examined in this work. We created a series of specimens designed to look like fresh, slightly weathered, moderately weathered, and highly weathered granite by slowly altering the proportions of constituent materials, like aggregates (stone, clay minerals, and mica substitutes) and a cementations binder. Wet-dry cycles and freeze-thaw cycles were used in accelerated weathering tests to replicate biological decomposition processes. At various weathering stages, the mechanical characteristics, such as hardness strength, compressive strength, and ultrasonic pulse velocity, was assessed. The findings show a direct relationship between a decrease of mechanical performance and the simulated level of weathering. Additionally, the study determines suitable material proportions at each weathering stage, providing important insights into the required composition.

ISBN: 978-93-48505-24-8

Keywords: Granite, Hardness, Compressive, Absorption, micro structure, surface Finish. Etc.,

EXPERIMENTAL INVESTIGATION ON CI ENGINE FUELED WITH WATERMELON SEED OIL BIODIESEL

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Abstract

This research investigates the performance and emissions characteristics of a compression ignition (CI) engine fuelled with biodiesel derived from watermelon seed oil. The study aims to evaluate the potential of watermelon seed oil as a sustainable alternative to conventional diesel fuel. Biodiesel was produced through a transesterification process, and various blends of biodiesel with diesel were tested in a CI engine under controlled conditions. Key performance indicators such as brake thermal efficiency, specific fuel consumption, and exhaust emissions (including CO, HC, NOx, and particulate matter) were measured and analysed. The results indicate that the use of watermelon seed oil biodiesel improves certain performance metrics compared to regular diesel, with optimal blend ratios resulting in enhanced thermal efficiency and reduced emissions. Furthermore, the study explores the impact of engine load and speed on the performance of the biodiesel blends. Overall, this experimental investigation demonstrates that watermelon seed oil biodiesel can be a viable and eco-friendly fuel option for CI engines, contributing to the development of renewable energy sources and reducing reliance on fossil fuels. The findings provide insights into the feasibility of utilizing agricultural waste for biodiesel production, promoting a circular economy in the energy sector.

Keywords: CI Engine, Watermelon Seed Oil, Transesterification Process, Eco Friendly fuel option

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HYDROGEN ENRICHMENT EFFECTS ON PERFORMANCE AND EMISSION CHARACTERISTICS OF A DIESEL ENGINE FUELED WITH JULIFLORA BIODIESEL AND DIETHYL ETHER FOR VARYING INJECTION TIMINGS

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Abstract

This study investigates the effects of hydrogen enrichment on the performance and emission characteristics of a single-cylinder diesel engine fueled with a blend of Juliflora biodiesel and diethyl ether (DEE) under varying fuel injection timings. Juliflora biodiesel, a non-edible and renewable biofuel, was blended with DEE to enhance ignition and combustion properties. Hydrogen, known for its high flame speed and clean combustion, was introduced at varying flow rates to further improve engine efficiency and reduce emissions. The engine was tested at different injection timings (19°, 21°, and 23° BTDC) to identify the optimal combination for peak performance. Results indicated that hydrogen enrichment significantly improved brake thermal efficiency and reduced brake specific fuel consumption. Emissions of CO, HC, and smoke were notably reduced, while NOx em.issions increased with higher hydrogen flow rates and advanced injection timings. The study concludes that an optimal synergy of hydrogen enrichment and injection timing can enhance the viability of Juliflora biodiesel-DEE blends as sustainable diesel fuel alternatives.

Keywords: Diethyl ether (DEE), Injection Timing, Thermal Efficiency, High flame speed and clean combustion

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EXPERIMENTAL INVESTIGATION ON CORROSION RESISTANCE BY USING THERMAL SPARY COATING WITH AL-MG ALLOYS

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Abstract

In this research, Al-Mg alloy coatings were deposited on C45 steel substrate by using electric arc spray technique. By electrochemical measurements and salt spray tests, the corrosion behavior of the coating was investigated. These tests were performed in 3.5 wt.% NaCl solution. Immersion testing for 240 hours indicated that the corrosion potential of the coating is more negative than that of the steel substrate of the corrosion potential of the coating. After 24 hours of immersion, total impedance was increased with increasing the immersion time. The cause could be that the pores are sealed with corrosion products that prevent further penetration of the solution through the coating. Salt spray test for 1360 hours did not result in red rust spots on the surface of coating. The salt spray test time increased, the corrosion rate of the coating decreased. The coating surface pitted and the cross section of the coating was full of long voids after the salt spray test. Also, XRD analysis demonstrated that the main corrosion product was Al(OH)3. The results obtained showed that arc thermal sprayed Al-Mg alloy coatings are able to effectively protect steel structures against corrosion in chloride containing aqueous solutions.

Keywords : C45 steel, 3.5 wt.%NaCl solution, Immersion testing for 240 hours, Salt spray test for 1360 hours &Thermal sprayed Al-Mg alloy coatings

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INVESTIGATION OF EMISSION CHARACTERISTICS ON COMPRESSION IGNITION ENGINE FUELLED BY WATERMELON SEED OIL BIODIESEL WITH DIFFERENT COMPRESSION RATIO

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Abstract

The emission properties of a compression ignition (CI) engine running on biodiesel made from watermelon seed oil (WSO) at different compression ratios are examined in this work. By analyzing its effects on engine emissions like carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx), and smoke opacity, the goal is to assess WSO biodiesel's suitability as a sustainable alternative fuel source. Different mixes of WSO biodiesel and diesel were used in the experiments, and the engine was run at compression ratios of 16:1, 17:1, and 18:1. The findings show that while NOx emissions tend to rise, increasing the compression ratio generally improves combustion efficiency and lowers CO and HC emissions. According to the study's findings, WSO biodiesel, especially at higher compression ratios, can serve.

Keywords: Watermelon seed,Watermelon Seed biodiesel, Increasing The Compression Ratio & Higher Compression Ratio

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INVESTIGATION OF MECHANICAL AND METALLURGICAL PROPERTIES OF 316L STAINLESS STEEL WELDMENT USING GAS TUNGSTEN ARC WELDING

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Abstract

The mechanical and metallurgical properties of 316L stainless steel weldments made with the Gas Tungsten Arc Welding (GTAW) process are examined in this work. The microstructure, tensile strength, hardness, and corrosion resistance of the weldments were evaluated in relation to the effects of welding parameters, including current, voltage, and shielding gas flow rate. The outcomes show that higher weldments with superior mechanical and metallurgical features can be produced using the GTAW process. Grain size, phase composition, and other microstructural features were correlated with mechanical properties, and the ideal welding parameters were determined.

Keywords: Gas tungsten arc welding,316L stainless steel, Tensile strength, corrosion resistance& Hardness strength

ADHESIVE STRENGTH ANALYSIS OF COLD SPRAY COATING OF AA2024/AL203 ON MAGNESIUM ALLOY

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Abstract

This research explores the adhesive strength of cold spray coatings of AA2024/A1203 on magnesium alloy. Process parameters like spray distance, spray pressure, and powder feed rate were examined on the adhesive strength of the coatings. The outcomes indicate that adhesive strength of coatings increases with increased spray pressure and reduced spray distance. The best process conditions were determined, and microstructure features of the coatings were examined via scanning electron microscope (SEM) and energy-dispersive

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spectroscopy (EDS). The adhesive properties of the coatings were analyzed via tensile testing and scratch testing. The research proves the feasibility of cold spray coating in enhancing the corrosion resistance and wear resistance of magnesium alloys.

Keywords: Cold spray coating, adhesive strength, magnesium alloy, Coating adhesion, surface modification.

EFFECT OF HYDROGEN ADDITION WITH JULIFLORA BIODIESEL ENHANCED WITH DI-ETHYL ETHER

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Abstract

Thus, in this present study, diesel fuel, Juli flora biodiesel blend (JFB20) and ignition improver diethyl ether (DEE) were tested in compression ignition engine. The Juli flora biodiesel is tested in a four stroke, single cylinder CI engine, after being subjected to transesterification process. Blend B20 (D80% with Biodiesel 20% by volume) is prepared by combining the prepared biodiesel with purediesel. The blends B20DEE5D75, B20DEE10D70, B20DEE15D65 are prepared with the prepared blend JFB20, ignition improver diethyl ether (DEE) and diesel, and tested in the above engine. Tabulated are the properties of the biodiesel and biodiesel blends of diethyl ether (DEE). We observed the effect of addition of Diethyl Ether with Diesel as BTE in the JFB20DEEE5 combination is almost same as diesel at 50% loading and JFB20, FB20DEE10 and JFB20DEE15 have slightly lower (less than 1%) BTE than pure diesel. The percentage increase of BSFC of JFB20, B20DEE5D75, B20DEE10D70 and B20DEE15D65is considerably higher more than 1%. The emission characteristics are also furthered and compared to diesel. CO emission in the JFB20 and JFB20DEE5 is higher than diesel 1.73% and 1.72% respectively, while the JFBDEE10 and JFB20DEE15 blends have closer CO emission value to that of diesel. The UBHC for all blends of biodiesel are much lower than diesel. Noxis considerably reduced in all the blends except JSB20 and the smoke is higher than diesel for the blends of biodiesel.

Keywords : Neat Diesel, Biodiesel, Diethyl ether, Engine behavior.

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EXPERIMENTAL INVESTIGATION ON IC ENGINE FUELLED WITH CANOLA OIL BIODIESEL

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Abstract

Research of alternative energy sources for internal combustion (CI) engines has been motivated by his increasing demand for sustainable and eco friendly fuels. The performance, combustion characteristics and emission behaviour of a compression ignition (CI) engine fuelled with canola oil biodiesel is experimentally investigated. The transesterification process was used to produce canola biodiesel and it was tested in various blends with conventional diesel fuel. The experiments were conducted in a single cylinder diesel engine under different load condition to determine key parameters like brake thermal efficiency (BTE), specific fuel consumption (SFC) and exhaust emissions like nitrogen oxides (NOx), carbon oxide (CO) and particulate matter (DM).

Keywords: IC engine, Canola oil biodiesel, Brake thermal efficiency & Emission Characteristics

EXPERIMENTAL ANALYSIS OF DIESEL ENGINE CHARACTERISTICS FUELLED BY CANOLA OIL BIODIESEL WITH DIFFERENT COMPRESSION RATIO

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Abstract

The performance, combustion, and emission characteristics of a single-cylinder diesel engine running on canola oil biodiesel at different compression ratios are examined in this study. Blends of diesel and canola biodiesel were tested experimentally at various engine compression ratios to examine the effects on emissions and engine efficiency. The findings show that raising the compression ratio lowers brake-specific fuel consumption and increases

thermal efficiency. Blends of biodiesel, however, demonstrated a notable decrease in CO and HC emissions while displaying somewhat higher NOx emissions when compared to diesel. According to the study's findings, canola biodiesel is a feasible substitute fuel, particularly when it is optimized with the right compression ratios for better engine performance and less environmental impact.

Keywords: Canola Oil Biodiesel, Thermal Efficiency & Single-Cylinder Diesel Engine

OPTIMIZING THE TWIN WIRE ARC SPRAYING PARAMETERS TO MINIMIZE THE POROSITY LEVEL OF COPPER WIRE COATINGS ON MILD STEEL USING RESPONSE SURFACE METHODOLOGY

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Abstract

The aim of this study is to optimize the parameters of Twin Wire Arc Spraying (TWAS) to minimize the porosity level in copper wire coatings deposited on mild steel substrates. The response surface methodology (RSM) was used to systematically explore the effect of various process parameters such as the spray distance, arc current, and gas flow rate on porosity of the coatings. The RSM framework allowed the development of a mathematical model that describes how those parameters affect the porosity levels. The experimental results were analysed to find out the optimal operating conditions which will provide the lowest porosity and therefore improve the mechanical properties of the coating thereby improving the overall performance of the coating. The results are important for industrial application of copper coatings for improving quality and durability of coated mild steel components.

Keywords: Twin Wire Arc Spraying, Copper Coating, Mild Steel, Porosity, Process Optimization, Response Surface Methodology

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PROCESS PARAMETER OPTIZATION OF COLD SPRAY PROCESSING OF AA2024/AL$_2$ O$_3$ MAGNESIUM ALLOY

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Abstract

Magnesium (Mg) alloys, especially AZ31B, are widely used in automotive and aerospace industries due to their lightweight nature and high strength-to-weight ratio. However, their poor corrosion resistance limits their broader applications. Cold spray processing is an advanced solid-state deposition technique that offers significant advantages in coating applications, particularly for aerospace and automotive industries. This study focuses on optimizing the process parameters of cold spray deposition for AA2024 aluminum alloy reinforced with Al_2O_3 on a magnesium alloy substrate. The optimization aims to enhance coating adhesion, hardness, wear resistance, and corrosion protection while minimizing material wastage.

Keywords: Cold spray coating, magnesium alloy, coating adhesion, surface modification, Micro structure.

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ENHANCING THE CORROSION RESISTANCE OF MAGNESIUM ALLOY THROUGH NICKEL ELECTROPLATING

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Abstract

Magnesium alloys are attractive materials for various industries due to their exceptional strength-to-weight ratio, but their susceptibility to corrosion limits their applications. This study investigates the enhancement of corrosion resistance of magnesium alloy through nickel electroplating. Nickel coatings were deposited on magnesium alloy substrates using an electroplating process. The corrosion resistance of the coated samples was evaluated using electrochemical techniques and salt spray testing. The results show that the nickel electroplating significantly improves the corrosion resistance of the magnesium alloy. The coated samples exhibited a notable reduction in corrosion rate and improved durability in corrosive environments. The findings suggest that nickel electroplating is a promising method for enhancing the corrosion resistance of magnesium alloys, enabling their use in a wider range of applications.

Keywords: Nickel coating, magnesium alloy, nickel plating

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IMPLEMENTATION OF A STEWART PLATFORM FOR ENHANCED PATIENT COMFORT IN AMBULANCE STRETCHERS

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Abstract

In modern emergency medical services, patient safety and comfort during transportation are critical concerns. This paper presents the design and implementation of a Stewart Platform integrated into ambulance stretchers to enhance patient comfort by minimizing vibrations and sudden movements. The Stewart Platform, a type of parallel manipulator with six degrees of freedom, is utilized for its high precision and stability in motion control applications. The study explores the mechanical design, kinematic modeling, and control system integration required to implement the Stewart Platform in the stretcher framework. Key components include actuators, sensors, and a real-time microcontroller to enable adaptive damping and vibration isolation. Advanced control algorithms, including Proportional-Integral-Derivative (PID) and Model Predictive Control (MPC), are employed to dynamically adjust the platform's position and orientation in response to road conditions. Experimental results demonstrate the effectiveness of the system in reducing vibrations and tilt angles during simulated ambulance rides. The platform maintains stability within ±2 degrees of tilt and reduces vertical oscillations by up to 70%. These improvements significantly enhance patient comfort and safety compared to conventional stretchers. This research contributes to the field of biomechanical engineering and emergency medical technology by providing a novel solution for mitigating transport-induced discomfort and potential injuries. Future work will focus on further miniaturization, cost optimization, and integration with telemedicine technologies to monitor and manage patient vitals during transit.

Keywords: Stewart platform, ambulance stretcher, vibration isolation, patient comfort, motion control, emergency medical services.

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PERFORMANCE OF THERMAL ENERGY STORAGE SYSTEM USING CYLINDRICAL ENCAPSULATED PCM

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Abstract

Thermal energy storage (TES) systems are essential for improving energy efficiency and facilitating the use of renewable energy sources. This research examines the performance of a TES system that employs cylindrical encapsulated phase change materials (PCMs) to enhance thermal regulation and optimize energy storage capabilities. The encapsulation of PCM in cylindrical containers ensures structural stability, reduces leakage, and enhances thermal conductivity through optimized heat transfer surfaces. A comprehensive experimental and numerical analysis is conducted to evaluate the thermal performance, charging/discharging characteristics, and energy storage capacity of the system. Key parameters such as heat transfer rates, melting and solidification times, and thermal stratification are examined. The effects of PCM properties, encapsulation dimensions, and operating conditions on system efficiency are analyzed. The findings demonstrate that cylindrical encapsulated PCM enhances thermal energy storage efficiency by offering greater energy density, improved thermal stability, and a more uniform temperature distribution. The findings demonstrate that this approach can be effectively applied to solar energy systems, HVAC systems, and industrial waste heat recovery processes. This research contributes to the development of advanced TES systems by addressing challenges related to heat transfer enhancement and energy storage efficiency, promoting sustainable energy solutions.

Keywords: Thermal energy storage (TES), phase change material (PCM), cylindrical encapsulation, heat transfer enhancement.

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PERFORMANCE OF DIFFERENT CONFIGURATION OF SENSIBLE STORAGE USING TRNSYS

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Abstract

Sensible heat storage plays a crucial role in thermal energy systems, enabling efficient energy management and improving system performance. This study evaluates the performance of different configurations of sensible storage using TRNSYS, a widely used simulation tool for transient energy system analysis. Various storage materials, tank geometries, and operational strategies are analyzed to determine their impact on thermal efficiency, heat losses, and energy storage capacity. The simulations explore both single-tank and multi-tank configurations under different charging and discharging conditions. Key performance indicators, including temperature distribution, stratification effectiveness, and overall system efficiency, are assessed to identify optimal storage configurations for diverse applications. The results provide valuable insights into designing and optimizing sensible storage systems for improved energy efficiency and sustainability.

Keywords: TRNSYS,TES,SHS.

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SMART PORTABLE BIOGAS PLANT: A SUSTAINABLE SOLUTION FOR ORGANIC WASTE UTILIZATION

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Abstract

This project presents the development of a fully automated and portable biogas plant designed to convert organic waste into renewable energy, contributing to sustainable development. A 1 -cubic-meter anaerobic digester was tested over a 30-day period, receiving a daily feed of 350 kg fresh cow dung and 350 liters of water in a 1:1.5 weight ratio. To boost biogas yield and minimize household waste, vegetable and kitchen wastes were also incorporated as co-substrates. The system operated under mesophilic temperature conditions (25–40°C), which promoted efficient microbial activity and digestion. Over the experimental duration, biogas production ranged between 1-cubic-meter indicating a steady and dependable output. The chosen feedstock ratio maintained ideal moisture levels, supporting optimal microbial growth, while the digester's design ensured efficient gas capture and waste breakdown. The results affirm the viability of compact biogas systems for decentralized energy production, especially in rural settings and small farms. Future studies are encouraged to examine performance under extended usage and varying operational parameters.

Keywords: Biogas: Anaerobic digestion: Organic waste: Renewable energy: Kitchen waste: Vegetable waste: Sustainable development: Portable digester.

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DESIGN AND FABRICATION OF AUTOMATIC SWEEPING MACHINE

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Abstract

The automatic sweeping machine design and fabrication is to improve the efficiency of cleaning public and private spaces. the machine comprises the latest sensors and control systems programmed with micro-controllers to undertake cleaning for various surfaces such as floors and pavements autonomously. Extensive tests on the developed prototype revealed significant enhancements in cleaning with regard to efficiency, compared to traditional methods, highlighting its applications in urban maintenance, industrial settings, and large-scale facilities. The project is not only an example of engineering advancement in innovative solutions but also adds strength to the germination of demands for automation in everyday tasks. The conventional road and floor cleaning machine is applied widely for several purposes, such as roads, railway stations, airports, hospitals, Bus stands, in multi buildings, colleges, etc. This machine is also operating on electrical energy for the operation. The operation is driven by an electric motor, and the energy supply to this electric motor is provided from the battery kept inside the vehicle. The project is primarily meant to clean roads and floor surfaces through effective functioning of the vehicle. Eco-friendly operated road and floor cleaning machines can work effectively in terms of area covered, time, and cost of road cleaning as compared to machines, thus being economical for use.

Keywords: Cleaning Mechanism, Cost-Efficient, Eco-friendly, Microcontroller.

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DESIGN AND FABRICATION OF FULLY AUTOMATED PORTABLE BIOGAS PLANT FOR SUSTAINABLE DEVELOPMENT

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Abstract

The design and fabrication of a fully automated portable biogas plant aim to harness organic waste for renewable energy generation, thereby promoting sustainable development. This study evaluates the performance of a 1-cubic-meter anaerobic digester for biogas production over a 30-day retention period. The digester was operated with a daily input of 350 kg of fresh cow dung and 350 Liters of water, mixed in a 1:1.5 weight ratio. In addition to cow dung, vegetable waste and kitchen waste were also utilized as supplementary feedstock to enhance gas production and reduce household organic waste. The system was maintained under mesophilic conditions (25–40°C) to enhance microbial activity and optimize the digestion process. 1-cubic-meter During the study period, the digester produced a cumulative biogas yield ranging from demonstrating consistent and reliable performance. The selected feedstock ratio ensured optimal moisture content and microbial efficiency, while the digester's design facilitated effective gas collection and waste stabilization. These findings highlight the potential of small-scale biogas systems for converting organic waste into renewable energy. This study underscores the significance of biogas digesters as sustainable solutions for rural households and small-scale agricultural operations. Further investigations are recommended to evaluate long-term performance and the impact of varying operational conditions on gas yield.

Keywords: Biogas; Anaerobic digestion; Renewable energy; Organic waste; Sustainable development; Portable design.

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AUTOMATED AIR AND WATER QUALITY ASSESSMENT SYSTEM

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Abstract

Environmental pollution poses a significant threat to public health and ecological balance, particularly in rapidly urbanizing regions. Traditional methods for monitoring air and water quality are often manual, costly, and lack the ability to deliver real-time insights. This project proposes a Smart IoT-Based Air & Water Quality Monitoring System designed to provide continuous, real-time data on key environmental parameters using low-cost, energy-efficient IoT sensors. The system measures pollutants such as PM2.5, PM10, CO2, NO2, SO2 (for air), and pH, turbidity, TDS, and temperature (for water). Data collected from sensor nodes is transmitted wirelessly to a cloud platform via protocols such as Wi-Fi or LoRa, where it is processed, analyzed, and visualized on an intuitive web and mobile dashboard.

The system includes features such as real-time alerts, predictive analytics using machine learning, and a mobile app for public awareness and accessibility. Additionally, it integrates solar power for sustainability, edge computing for local processing, and has scope for autonomous drone-based sensing in hard-to-reach areas. This solution aims to support proactive environmental management, aid government bodies in decision-making, and empower citizens with transparent, localized pollution data. Through this system, we bridge the gap between raw environmental data and actionable intelligence, contributing to a cleaner, healthier, and smarter ecosystem.

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EVALUATING THE FEASIBILITY OF A BLOCKCHAIN-ENABLED AI PLATFORM FOR CARBON CREDIT VERIFICATION AND TRADING

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Abstract

Climate change is one of the most urgent challenges facing the planet, driven by rising greenhouse gas (GHG) emissions from activities like fossil fuel combustion, industrial processes, and deforestation. These emissions have led to global temperature increases, sea-level rise, and more frequent extreme weather events. The Intergovernmental Panel on Climate Change (IPCC, 2021) warns that without significant action, the world may face severe environmental and socio-economic consequences. While international agreements such as the Paris Agreement lay the groundwork for collective climate action, market-based solutions like carbon credits are gaining momentum as flexible tools to complement regulatory approaches.

A carbon credit represents one metric ton of carbon dioxide, or its equivalent, that has been avoided or removed through certified climate mitigation projects. These include renewable energy development, reforestation, methane capture, and energy efficiency improvements. Carbon credits operate in both compliance and voluntary markets, offering financial incentives for emission reductions and sustainable development, particularly in lower-income regions. This paper explores the structure, effectiveness, and impact of carbon credits. It examines how they contribute to real emissions reductions, promote environmental justice, and support corporate climate responsibility. It also considers the challenges of transparency and accountability, assessing whether carbon credits are a viable long-term solution or a temporary workaround in global climate policy.

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NEXT-GEN FARMING PLANT DISEASE DETECTION POWERED BY DEEP LEARING

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Abstract

Agricultural development is a critical strategy for promoting prosperity and addressing the challenge of feeding nearly 10 billion people by 2050. Plant diseases can significantly impact food production, reducing both quantity and diversity. Therefore, early detection of plant diseases through automatic detection methods based on deep learning can improve food production quality and reduce economic losses. While previous models have been implemented for a single type of plant to ensure high accuracy, they require high-quality images for proper classification and are not effective with low-resolution images. To address these limitations, this paper proposes the use of pre-trained model based on convolutional neural networks (CNN) for plant disease detection. The focus is on fine-tuning the hyperparameters of popular pre-trained model such as EfficientNetV2S, to achieve higher accuracy in detecting plant diseases in lower resolution images, crowded and misleading backgrounds, shadows on leaves, different textures, and changes in brightness.

The study utilized the Plant Diseases Dataset, which includes infected and uninfected crop leaves comprising 38 classes. In pursuit of improving the adaptability and robustness of our neural networks, we intentionally exposed them to a deliberately noisy training dataset. This strategic move followed the modification of the Plant Diseases Dataset, tailored to better suit the demands of our training process. Our objective was to enhance the network's ability to generalize effectively and perform robustly in real-world scenarios. This approach represents a critical step in our study's overarching goal of advancing plant disease detection, especially in challenging conditions, and underscores the importance of dataset optimization in deep learning applications.

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A WEARABLE IOT- BASED HEALTHCARE MONITORING SYSTEM FOR ELDERLY PEOPLE

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Abstract

With the increase of the aging population, there has been a high demand for a wearable health monitoring device assisting elderly to maintain their physical health conditions. Such devices are highly required to monitor elderly people with limited mobility living alone. As the healthcare costs are escalating there has been a need for an affordable option to monitor elderly people from a remote location, provide them the vital medical data at home, as well as connect them with the nearest professional healthcare providers. As a result, proposing an IoT-based wearable system that provides a real-time health monitoring for elderly people becomes essential. It keeps track of the health status of elderly people, alert healthcare professionals about any changes or abnormalities in real time and reminds elderly people about the defined medicine time. Furthermore, the use of a dynamic model that represents the changes of the elderly' behavioural is highly important. This work proposes a new approach for healthcare monitoring using Thing Speak IOT platform. This approach is modelled using multi-agent's systems. It surveys vital signs such as heart rate, blood pressure, and body temperature, as well as it provides fall detection and emergency alert functions.

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PREDICTING HEART DISEASE AT EARLY STAGES USING MACHINE LEARNING

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Abstract

Heart disease is one of the leading causes of death globally. Early detection and diagnosis can significantly reduce mortality rates and healthcare costs. In this project, we aim to develop a machine learning-based prediction model that can identify the likelihood of heart disease in patients based on health parameters such as age, cholesterol level, blood pressure, chest pain type, and more. Using a publicly available dataset, we will pre process the data and apply different machine learning algorithms such as Logistic Regression, Decision Tree, Random Forest, and Support Vector Machine (SVM) to build an efficient and accurate prediction system. The performance of each model will be evaluated using metrics like accuracy, precision, recall, and F1-score.This project will also focus on interpretability of the model to ensure the results are understandable and trustworthy for healthcare professionals. The ultimate goal is to assist in early diagnosis, enabling timely medical intervention and improving patient outcomes.

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LIVING SMARTER: THE ROLE OF SMART APPLIANCES IN ASSISTED LIVING

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Abstract

This paper explores the design and implementation of a smart home automation system aimed at improving the quality of life for elderly and physically challenged individuals. The system focuses on creating a safe, secure, and user-friendly environment by enabling remote monitoring and control of various household functions. Users and caregivers can access real-time information and receive instant alerts, allowing for timely responses to changes in the home environment. The system supports daily living by automating essential tasks, helping to reduce dependence on others while ensuring comfort and safety. A simulation-based model demonstrates the practical application and effectiveness of the system, showcasing its potential to support independent living and enhance overall well-being. This solution offers a scalable and affordable approach to assistive home care, aligning with the growing need for personalized support in residential settings.

HAND GESTURE CONTROLLED ROBOTIC ARM USING PYTHON

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Abstract

This project explores the development of a gesture-controlled robotic arm designed to respond to real-time hand movements, enabling a more natural form of human-machine interaction. By integrating OpenCV for hand gesture recognition and an Arduino Uno

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microcontroller for servo motor control, the system accurately mimics the movements of a human hand using a set of servo motors. Hand gestures are captured through a camera, processed using OpenCV, and translated into commands that guide the robotic arm. The system supports common gestures like an open hand, fist, or specific finger movements, each linked to a distinct arm function. It is scalable, allowing for additional servos to handle more complex motions. The use of open-source tools enables rapid prototyping and customization, making the system cost-effective and adaptable for various applications—from assistive technology for individuals with disabilities to industrial automation. Overall, the project demonstrates the potential of gesture-based control to create intuitive and interactive robotic systems, offering a solid foundation for future advancements in the field.

IMPLEMENTATION OF URL SCANNER USING DEEP LEARNING

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Abstract

In today's digital era, phishing attacks have become one of the most prevalent cybersecurity threats, tricking users into revealing sensitive information by disguising malicious websites as legitimate ones. This project proposes the development of a real-time AI-Based Phishing URL Detector using a hybrid deep learning model that combines Artificial Neural Networks (ANN) and Long Short-Term Memory (LSTM) networks. ANN will handle static URL-based features (like URL length, domain age, etc.), while LSTM will analyze dynamic patterns and behavior in URLs. By leveraging both static and sequential analysis, the model aims to enhance phishing detection accuracy and reduce false positives. The detector will be implemented as a Chrome extension, allowing users to scan links in real-time before clicking on them. This solution will provide seamless phishing protection by detecting and blocking suspicious URLs, thereby mitigating phishing risks and ensuring safer browsing experiences.

Keywords: Artificial Neural Networks, Long Short-Term Memory.

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IMPLEMENTATION OF A CNN-BASED SMART WASTE MANAGEMENT SYSTEM USING TENSOR FLOW-LITE AND THING SPEAK IN IOT ENVIRONMENT

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Abstract

Effective waste management is a critical challenge in urban environments, necessitating innovative solutions to enhance recycling processes and reduce environmental impact. This paper presents the design and implementation of an Automated Waste Segregation System that integrates deep learning algorithms, sensor- based technologies, and Internet of Things (IoT) capabilities to accurately classify and separate waste materials, thereby promoting efficient recycling practices.

Keywords: Smart Waste Management, Artificial Intelligence, Convolutional Neural Networks (CNN), Tensor Flow Lite, Thing Speak, IoT, Waste Classification, Smart Bins, Waste monitoring system.

REACH THE MEDICAL SUPPORT TO ACCIDENTAL VEHICAL BY USING IOT WITH MEMS SENSOR

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Abstract

This paper proposes a novel system to enhance the efficiency of medical emergency services during road accidents. The increasing number of accidents due to reckless driving, drunk driving, and driver negligence necessitates a more effective way to respond to these incidents promptly. The current system often faces delays in informing the ambulance and

police authorities, which may lead to severe consequences for the victims. To address this issue, the paper suggests integrating sensors in vehicles to monitor critical data like displacement, location, and chassis number using a Global Positioning System (GPS) device. This information would be shared through the Internet of Things (IoT) to a control center, allowing them to dispatch the necessary emergency response units to the accident site swiftly. The proposed system utilizes a gyro sensor (MEMS sensor) to detect angle changes between 45° and 315° and a vibration sensor that activates at a collision impact frequency of 90 Hz or more. This system could potentially serve as a reliable addition to the safety features in vehicles manufactured in India, ensuring better accuracy in accident detection and reporting. In conclusion, this paper presents a valuable concept to improve medical emergency services during road accidents by implementing a smart vehicle-based system. The integration of sensors and IoT technology can significantly reduce response time and save lives by providing immediate assistance to victims in need.

Keywords: IoT, Memes Sensor, GPS, Microcontroller

INTERNET OF THINGS BASED SMART FLOOD FORECASTING AND EARLY WARNING SYSTEM

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Abstract

In general Flood is considered as an inescapable natural event. Also, flood creates a huge economic damage and cause a significant loss in human life. Using different sensors, researchers made a flood level detecting device with the help of Arduino UNO. Proposed model is also useful for us in anticipating the upcoming calamities and to take essential activities by emergency and recover experts to spare the life of thousands of individuals before this basic condition happens. The Flood Detector System using Arduino is created to be one of the quickest strategies to monitor flood and Internet of Things (IoT) is one of the most important technical trends, which is utilized to monitor flood and human made resource

to help in predicting and detecting essential events like flood, fire, gas and water leak that can position an threat to human life.

Keywords- Flood alert system, Arduino UNO; Internet of Things; Sensors; Forecasting system; Early warning system

IoT BASED AUTOMATED WASTE SEGREGATION SYSTEM FOR EFFICIENT WASTE MANAGEMENT

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Abstract

Waste management is a critical challenge in modern society, and efficient waste segregation plays a crucial role in sustainable waste disposal. This proposed system focuses on an automated waste segregation mechanism that classifies waste into biodegradable and non-biodegradable categories. It utilizes an IOT-based transparent bin to differentiate waste levels and integrates sensors for accurate classification. The system employs ultrasonic sensors to detect the fill level of the bins and provide online notifications when they reach capacity. Conductive plate sensors distinguish between wet and dry waste, while a metal proximity sensor identifies metal waste separately. The three-bin system effectively segregates wet, dry, and metal waste, reducing manual intervention. Designed for both indoor and outdoor use, the system ensures minimal time consumption and reduces human effort in waste management. By implementing advanced sensor technologies, this automated waste segregation system enhances efficiency, promotes environmental sustainability, and contributes to smarter waste disposal practices.

Keywords: Waste Management, IoT, Automated Waste Segregation, Biodegradable Waste, Non-Biodegradable Waste, Ultrasonic Sensors, Conductive Plate Sensors, Metal Proximity.

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IMPLEMENTATION OF STOCK PRICE AUTHENTICITY DETECTION SYSTEM USING MACHINE LEARNING

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Abstract

The Stock Market Price Authenticity Detection System is a comprehensive project aimed at leveraging machine learning techniques to identify fake stock market prices and provide users with real-time, accurate market values. The system employs a Random Forest algorithm for training a model that distinguishes between genuine and manipulated stock prices. The workflow begins with data collection, where historical stock market data is gathered for training the machine learning model. The chosen algorithm, Random Forest, is utilized to build a robust model capable of detecting anomalies in stock prices. Once the model is trained, it is deployed for real-time usage. The user interface is divided into three main pages. The Welcome Page serves as the entry point, providing users with an introduction to the system. The Login Page ensures secure access, protecting user data and maintaining confidentiality.

The heart of the system lies in the Detection Page, where users input NASDAQ values along with corresponding stock prices obtained from external sources. The machine learning model then evaluates the authenticity of the entered prices. If the system detects discrepancies or inaccuracies, it flags the data as potentially fake. In such cases, the system not only alerts the user but also retrieves and displays the exact live price of the entered NASDAQ values. This project contributes to the financial sector by offering a tool to identify fraudulent stock market data, promoting transparency, and assisting users in making informed investment decisions. The combination of machine learning algorithms and real-time data retrieval enhances the systems accuracy and responsiveness, ensuring a reliable solution for detecting fake stock market prices.

Keywords: Stock Market Price Detection, Fake Price

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IMPLEMENTATION OF RESILIENT LORA NETWORK FOR EMERGENCY COMMUNICATION IN RURAL AREAS & REMOTE VILLAGES

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Abstract

In remote and rural areas, communication failures during natural disasters pose significant challenges for emergency response teams. This paper proposes a LoRa (Long Range) network-based resilient communication system designed to provide low-power, long-range connectivity for disaster management. Unlike traditional cellular or satellite networks, LoRa operates efficiently in resource-constrained environments, ensuring real-time alerts and monitoring in rural areas. The proposed system integrates IoT sensors, LoRa gateways, and cloud-based analytics to facilitate emergency communication. Field studies demonstrate high reliability, cost-effectiveness, and sustainability, making this solution ideal for disaster-prone regions.

Keywords: LoRa network, emergency communication, rural connectivity, IoT, disaster management, real-time alerts, low-power networks.

IMPLEMENTATION OF DEEP LEARNING BASED DRIVER FATIGUE DETECTION USING KERAS AND OPENCV

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Abstract

Drowsy driving is a prevalent and a serious public health issue that deserves. Privacy-Preserving Federated Transfer Learning for Driver Drowsiness of their Detection. System initialisation-initialise camera and sensor of the modules. A Load of the fatigue detection models. Recent studies estimate that around 20% of car crashes have been caused by drowsy drivers. A person when he or she does not have proper rest especially a driver, tends to fall asleep causing a traffic accident. Nowadays, one of the main goals in the development of new

advanced driver assistance systems is trustworthy drowsiness detection. It is why the present project wants to realize a system that can detect the drowsiness of the driver, in order to reduce traffic accidents. As a premise, it was assumed that the drowsiness is linked to the images in which the driver has closed eyes and the alert state is linked to the images in which the driver has opened eyes. After the face is deducted using Naïve Bayes Region of Interest, the region containing eye and mouth has to be separated. A image with took inside a vehicle, includes the driver's face. Typically, a camera takes image within the RGB model(Red, Green and Blue).

Keywords: Driver drowsiness, Machine learning Recommendation Camera accident avoidance.

DEVELOPMENT OF AN INTELLIGENT OCR-POWERED APPLICATION FOR REAL-TIME VEHICLE NUMBER PLATE RECOGNITION ON NATIONAL HIGHWAYS

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Abstract

In this project a new approach of automatic vehicle number plate recognition in National Highways and this approach enables the vehicle to automatically pass the NH roads by using object detection, 3D environment construction, virtual line generation, path planning. The system is to monitor the vehicles that are entering and going out of the NH roads. All vehicles have their own unique license plate number, so the abstraction of plate number plays a major role in this system. The vehicle number plate is taken by the tool like machine learning based camera which is placed at the road junctions. The captured image will be processed by the automatic number plate recognition using OCR (optical character recognition) algorithm, here we using Gaussians filters for remove the blueness of the image using a Gaussian kernel suppresses only high-frequency spatial information. Then the entry and exit vehicle number should be recorded. A database is created with the vehicle number. This method is an efficient way of recognizing the vehicle number plate and strengthens the security system. In case of centralized receiver all the entrance records are kept in storage and it will check the

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presence of theft vehicle entering into the NH roads, it will be noticed and capture the vehicle image and vehicle information's will be send to authorized person using IMAP (Internet Message Access Protocol). The OCR technique is used to identify the number. This system has many advantages like theft detection, less man power, user friendly, vehicle logging and less processing time.

Keywords: Vehicle number plate recognition, Machine learning, OCR technology, Intelligent Transportation system.

IMPLEMENTATION OF ONLINE SIGNATURE VERIFICATION USING CNN ALGORITHM

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Abstract

Online signature verification using Convolutional Neural Networks (CNN) is an advanced biometric authentication technique that ensures the authenticity of digital signatures by analyzing their dynamic properties. This system captures real-time signature data, such as pen pressure, stroke order, velocity, and trajectory, to distinguish between genuine and forged signatures. CNN, a deep learning-based image processing algorithm, is employed to extract intricate features from the signature patterns, enabling robust classification and verification. The model is trained on a dataset of authentic and forged signatures, learning to differentiate subtle variations that might be imperceptible to traditional methods. By leveraging CNN's ability to identify complex spatial hierarchies, this approach enhances security and reduces the risk of fraudulent activities in online transactions, banking, and document authentication systems. The proposed system provides high accuracy, adaptability, and efficiency, making it a reliable solution for real-time signature verification.

Keywords: CNN (Convolutional Neural Network), Support Vector Machine, pycharm community

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DEVELOPING AI-ENABLED REAL-TIME SPEECH-TO-SIGN LANGUAGE CONVERTER WITH ANIMATED AVATARS

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Abstract

This paper introduces an AI-enabled system for real-time conversion of speech to sign language using animated avatars, aimed at fostering inclusivity for individuals with hearing and speech impairments during government functions and public events. By integrating cloud-based speech recognition, natural language processing, and 3D avatar animation, the solution removes the need for human interpreters, offering a scalable and efficient alternative. Initial tests demonstrate low latency and high accuracy, making it suitable for real-world deployment. This approach not only enhances accessibility but also reduces logistical challenges in public communication settings, paving the way for broader adoption.

Keywords: Animated avatars, artificial intelligence, cloud computing, sign language.

DEVELOPMENT OF MACHINE LEARNING APPROACHES FOR THE PREDICTION OF OBESITY USING PUBLICLY AVAILABLE GENETIC PROFILES

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Abstract

This paper presents a novel approach based on the analysis of genetic variants from publicly available genetic profiles and the manually curated database, the National Human Genome Research Institute Catalog. Using data science techniques, genetic variants are identified in the collected participant profiles and then indexed as risk variants in the National Human Genome Research Institute Catalog. Indexed genetic variants or Single Nucleotide Polymorphisms are used as inputs in various machine learning algorithms for the prediction of obesity. Body mass index status of participants is divided into two classes, Normal Class

and Risk Class. Dimensionality reduction tasks are performed to generate a set of principal variables - 13 SNPs - for the application of various machine learning methods. The models are evaluated using receiver operator characteristic curves and the area under the curve. Machine learning techniques including gradient boosting, generalized linear model, classification and regression trees, k-nearest neighbours, support vector machines, random forest and multilayer perceptron neural network are comparatively assessed in terms of their ability to identify the most important factors among the initial 6622 variables describing genetic variants, age and gender, to classify a subject into one of the body mass index related classes defined in this study. Our simulation results indicated that support vector Machine generated the highest area under the curve value of 90.5%.

Keywords: Data Science; Feature Selection; Genetics; Machine Learning; besity; Receiver Operating Characteristic Curve; Single Nucleotide Polymorphisms.

FACE RECOGNITION BASED SMART ATTENDANCE SYSTEM WITH AUTOMATED SMS ALERTS

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Abstract

Attendance management plays a vital role in educational institutions and workplaces. Traditional attendance methods, such as manual marking or RFID based systems, often face challenges like errors, proxy attendance, and inefficiencies. To address these issues, this project proposes a Face Recognition-Based Smart Attendance System with an Automated Alert System. The system utilizes AI powered facial recognition technology to automatically capture and verify individuals' attendance, eliminating manual intervention and ensuring accuracy. Additionally, an automated alert system notifies the administration or relevant authorities in real time when attendance is marked, helping to monitor attendance trends and detect irregularities. This enables efficient decision-making and ensures better supervision of attendance records. The system is designed to be fast, secure, and scalable, making it suitable for schools, colleges, and corporate environments. It reduces paperwork, minimizes errors, and enhances security by preventing unauthorized access or proxy attendance. With its real-

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time alerts, data analytics, and AI-driven automation, the system significantly improves the efficiency of attendance management while ensuring a seamless and transparent process.

Keywords: Face Recognition Technology, Automated Attendance System, AI-Powered Verification, Real-Time Alerts, Secure Attendance Monitoring.

IMPLEMENTATION OF IOT BASED PRE-ARRIVAL INTEGRATION FOR AUTOMATIC FASTAG WALLET BALANCE CHECKING SYSTEM USING RFID

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Abstract

In today's fast-paced world, the integration of technology in various aspects of daily life has become essential to streamline processes and enhance efficiency. Toll collection systems are no exception, where traditional methods are gradually being replaced by automated solutions to minimize traffic congestion and expedite transactions. The introduction of Fast Tag or electronic toll collection systems has significantly reduced waiting times at tollgates, offering convenience to commuters. However, managing and monitoring wallet balances associated with these systems can still pose challenges. The proposed Automatic Fast Tag Wallet Balance Checking System near Tollgate aims to address this issue by providing a seamless and automated solution for users to check their wallet balances in real-time before approaching the tollgate. This system leverages advancements in RFID (Radio Frequency Identification), live GPS Tracking and IoT (Internet of Things) technologies to enable swift and hassle-free balance verification.

Keywords: Wallet Checking, RFID Technology, GPS Tracking, Safe Payment, No Traffic Toll Plaza, Enhance Efficiency, Risk Analysis, and Accuracy.

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EMPLOYEES LAYOFF PREDICTION USING RECCURENT NEURAL NETWORK

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Abstract

Employee layoffs can have a significant impact on both organizations and individuals, making it crucial to develop predictive models that can identify potential layoffs in advance. This project focuses on **employee layoff prediction using a Recurrent Neural Network (RNN)**, leveraging historical employee and organizational data to forecast the likelihood of layoffs. The model takes into account various factors such as employee performance, tenure, company financial status, industry trends, and economic conditions. By utilizing RNNs, which excel in handling sequential data, the system can identify hidden patterns and dependencies over time to improve prediction accuracy.

The proposed model processes **time-series workforce data** and learns temporal relationships to anticipate potential layoffs. Additionally, techniques such as **Long Short-Term Memory (LSTM) networks** are incorporated to address vanishing gradient issues and enhance long-term dependency learning. The predictive insights generated by the model can help businesses make data-driven decisions, optimize workforce management, and proactively mitigate risks associated with employee layoffs. This research aims to contribute to **human resource analytics** by providing a robust and intelligent framework for layoff forecasting, ultimately assisting organizations in strategic planning and employee retention strategies.

Keywords: Recurrent, layoff, gradient, workforce, retention.

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IMPLEMENTATION OF IoT- BASED SYSTEM FOR DETECTING SUICIDAL IDEATION IN STUDENTS

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Abstract

Suicidal ideation among students is a critical mental health concern that necessitates early detection and intervention. This study proposes an AI-driven system for detecting suicidal ideation using machine learning and natural language processing (NLP). The system analyzes students' textual data from social media posts, academic forums, and self-reported surveys to identify distress signals and warning signs. Sentiment analysis, emotion recognition, and linguistic pattern analysis help assess risk levels. Deep learning models, such as recurrent neural networks (RNN) and transformers, enhance the system's accuracy in identifying suicidal tendencies. Additionally, the system integrates a real-time alert mechanism that notifies mental health professionals or counselors when high-risk cases are detected. By leveraging artificial intelligence, this approach aims to provide an early warning system, enabling timely psychological support and suicide prevention among students.

Keywords: Suicidal Ideation Detection, Mental Health, Machine Learning, Natural Language Processing (NLP), Sentiment Analysis, Deep Learning, Student Psychology, Early Intervention, Suicide Prevention, Emotion Recognition.

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IMPLEMENTATION OF A CNN-BASED CURRENCY DETECTION AND VOICE ALERT SYSTEM FOR THE VISUALLY IMPAIRED

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Abstract

Currency note detection with voice alert is an assistive technology designed to help individuals, especially those with visual impairments, accurately identify different currency denominations. This system utilizes image processing techniques to recognize four different currency notes based on their unique visual features such as size, color, patterns, and security marks. A camera module captures the image of the currency note, and machine learning algorithms or feature extraction methods process the image to classify it into the correct denomination. Once the note is identified, the system generates a voice alert that announces the detected currency value, providing real-time feedback to the user. This solution enhances financial independence and security by reducing the risk of errors in transactions. Additionally, the system can be implemented on embedded platforms like Raspberry Pi or mobile applications, making it accessible and user-friendly.

Keywords: Currency recognition, image processing, machine learning, voice alert, assistive technology, visual impairment, currency denomination, real-time detection, embedded system, feature extraction.

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IMPLEMENTATION OF AUTOMATED MONITORING AND IRRIGATION SYSTEM

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Abstract

The IoT based Agriculture Monitoring System is a smart solution aimed at enhancing agricultural productivity and resource optimization through automation and real-time monitoring. The system integrates a moisture sensor to measure soil moisture levels, which are processed by an Analog-to-Digital Converter (ADC) and transmitted to an ESP8266 Wi-Fi module. The ESP8266 serves as the central controller, relaying data and controlling connected devices such as the LCD display, buzzer, and pump motor. The IC7805 regulator ensures the proper power supply to the ESP8266 and other components. When low moisture levels are detected, the ESP8266 triggers the relay to activate the pump motor for irrigation. Additionally, alerts can be provided via a buzzer and displayed on the LCD screen for real-time feedback. This system improves water management, reduces manual effort, and promotes sustainable agriculture practices, offering farmers an efficient way to monitor and automate irrigation processes using IoT technology. The moisture sensor continuously monitors soil moisture levels and sends data to the ESP8266, which processes the information and activates a relay to control the pump motor This innovative solution leverages IoT technology to optimize water usage, reduce labor costs, and promote eco-friendly practices, thereby making agriculture smarter, more efficient, and sustainable.

Keywords: Smart Agriculture, Soil Moisture Monitoring, Automated Irrigation System, Real-Time Monitoring, Sustainable Farming, Precision Agriculture.

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DEVELOPMENT OF SECURE CLOUD-EDGE INTEGRATED ARCHITECTURE FOR NEXT – GEN SMART MANUFACTURING

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Abstract

The rapid evolution of cloud manufacturing has revolutionized industrial production by enabling resource-sharing, on-demand manufacturing, and intelligent decision-making. However, security challenges such as data breaches, cyber attacks, and unauthorized access pose significant threats to the integrity and reliability of cloud manufacturing systems. This paper proposes a Cloud-Edge Integrated Security Architecture to enhance the security and resilience of modern cloud manufacturing environments. The architecture leverages edge computing to process and filter data locally before transmitting it to the cloud, reducing latency and mitigating potential cyber threats. It incorporates block chain for secure data transactions, AI-driven anomaly detection for real-time threat monitoring, and zero-trust authentication for robust access control. By integrating cloud and edge security mechanisms, the proposed architecture ensures data confidentiality, integrity, and availability while maintaining efficient system performance. Experimental results demonstrate that this approach effectively reduces security vulnerabilities, improves response time to cyber threats, and enhances the overall reliability of cloud manufacturing systems. This research provides a scalable and secure framework to support the next generation of smart manufacturing.

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SMART CROP GUARDIAN: INTELLIGENT IMAGE BASED PROTECTION FROM WILD ANIMAL INTRUSIONS

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Abstract

The issue of animal attacks is increasingly concerning for rural populations and forestry workers. To track the movement of wild animals, surveillance cameras and drones are often employed. However, an efficient model is required to detect the animal type, monitor its locomotion and provide its location information. Alert messages can then be sent to ensure the safety of people and foresters. This paper presents a Hybrid Visual Geometry Group (VGG)−19+ Bidirectional Long Short-Term Memory (Bi-LSTM) network to detect animals and generate alerts based on their activity. These alerts are sent to the local forest office as a Short Message Service (SMS) to allow for immediate response. The proposed model exhibits great improvements in model performance, with an average classification accuracy of 98%, a mean Average Precision (mAP) of 77.2%, and a Frame Per Second (FPS) of 170. The model was tested both qualitatively and quantitatively using 40,000 images from three different benchmark datasets with 25 classes and achieved a mean accuracy and precision of above 98%. This model is a reliable solution for providing accurate animal-based information and protecting human lives.

Keywords: Animal detection, VGG-Net, Bi-LSTM, convolutional neural network, activity recognition, video surveillance, wild animal monitoring, alert system.

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IMPLEMENTATION OF EFFICIENT DEEP LEARNING MODEL FOR ONLINE FRAUD DETECTION (EDLM)

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Abstract

An Efficient Deep Learning Model for Online Fraud Detection (EDLM), is a powerful website security app that will protect your website from hackers, attacks and other threats. It will protect your website from SQLi Attacks (SQL Injections), XSS Vulnerabilities, Spam and many other types of threats. It uses an intelligent algorithms (similar to the ones used by major industry companies) to detect all known hacker attacks as well as new unknown threats using code recognition and patterns, and automatically takes action. It comes with powerful admin panel from which you can view all logs and it is also integrated with Ban System from which can be banned Visitors (IP Addresses), Countries, IP Ranges, Internet Service Providers (ISP), Browsers, Operating Systems (OS) and Referrers. The Admin Panel has many features and settings. Through it can be easily managed the security of your website. It is a powerful Web Application Firewall designed to protect all PHP software's, from custom scripts to popular shopping cart software's and CMS applications. It allows any website administrator to benefit from very advanced and powerful security features. It is very fast, optimized and requires very low system resources.

Keywords: SQL Injections, XSS Vulnerabilities, Spam, SQLi Attacks

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THE EFFICIENT MOBILE APP FOR FARMERS AND GARDENERS TO DETERMINE AND DIAGNOSIS OF HORTICULTURE

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Abstract

This paper presents a mobile application designed to assist farmers and gardeners in diagnosing horticultural crop diseases, monitoring growth stages, and optimizing resource use. Leveraging artificial intelligence (AI), image processing, and a user-friendly interface, the app addresses challenges such as early disease detection, inaccurate growth tracking, and inefficient resource management. By integrating automatic plant identification, disease diagnosis, and treatment suggestions, it aims to reduce yield losses and financial burdens. Evaluated against existing apps like Plantix and Agrio, the proposed solution emphasizes offline functionality, multilingual support, and community features for enhanced usability among rural users.

SPARKLING A NEW ERA FOR SMART CITIES

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Abstract

Smart cities are revolutionizing the way urban spaces function by integrating cutting-edge technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and advanced data analytics to create efficient, responsive, and sustainable environments. These cities leverage digital infrastructure to enhance public services, reduce resource consumption, and improve the overall quality of life for residents. With rapid urbanization and the growing demands on urban systems, smart cities present a transformative approach to urban development, emphasizing sustainability, technological innovation, and citizen participation.

Keywords: Smart cities, Internet of Things, Artificial Intelligence, sustainability, urban development.

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THE FUTURE OF TRANSPORTATION: A COMPREHENSIVE STUDY ON AUTONOMOUS VEHICLES

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Abstract

The evolution of transportation systems is undergoing a significant transformation with the emergence of Autonomous Vehicles (AVs), also referred to as self-driving cars. These vehicles operate using a combination of advanced technologies such as artificial intelligence (AI), machine learning, computer vision, and an array of sophisticated sensor systems including LiDAR, radar, and cameras. Autonomous Vehicles are designed to navigate and respond to complex environments without direct human intervention, aiming to minimize human error, which remains a leading cause of traffic accidents worldwide. This research paper presents a comprehensive overview of the technological architecture that powers AVs, including the integration of perception, decision-making, and control systems. It further investigates the levels of vehicle autonomy as defined by the Society of Automotive Engineers (SAE) and evaluates the progress made by industry leaders and research institutions in achieving higher levels of automation. Beyond the technical dimension, this paper explores the multifaceted societal implications of AV adoption, such as their potential to improve road safety, enhance mobility for individuals with disabilities, reduce traffic congestion, and contribute to environmental sustainability through optimized driving efficiency. Additionally, it addresses the complex legal, ethical, and regulatory challenges that must be resolved to ensure the safe and equitable deployment of AVs on public roads. The study also considers case studies from early AV deployments and pilot programs across different countries, providing real-world insights into both successes and limitations. Finally, the paper envisions the future trajectory of AV technology, highlighting its potential integration into smart cities and next-generation transportation networks.

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SWARM-BASED MULTI-ROBOT SYSTEM FOR HAZARD DETECTION AND BATTLEFIELD SURVEILLANCE

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Abstract

As modern combat zones and hazardous environments grow more complex, there is a rising demand for intelligent, autonomous surveillance systems. This paper presents the development of a multi-robot system based on swarm intelligence for real-time hazard detection and battlefield observation. The proposed system employs a distributed group of autonomous robots that collaboratively navigate and monitor high-risk areas. Each robot is equipped with sensors capable of identifying various threats, including chemical hazards, explosive devices, and hostile entities. The system utilizes a decentralized communication architecture, enabling robots to share information in real time and make collective decisions without relying on a central unit. This design enhances the system's resilience, scalability, and operational efficiency, especially in unpredictable or GPS-denied environments. Compared to traditional single-robot systems, the swarm-based approach offers greater fault tolerance, broader coverage, and improved cost-effectiveness. Validation through both simulation and physical testing confirms the system's reliability in threat detection and area coverage, highlighting its potential for military and emergency response operations.

ISBN: 978-93-48505-24-8

AUTONOMOUS PROCTORING SOFTWARE: A COMPREHENSIVE FRAMEWORK FOR ENSURING ACADEMIC INTEGRITY IN REMOTE EXAMINATIONS

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Abstract

A novel autonomous proctoring software architecture that guarantees academic integrity throughout online tests. Strong, scalable, and minimally intrusive proctoring systems are more important than ever in the context of growing distant learning. Our method combines behavior analysis, biometric identification, and sophisticated machine learning algorithms to track candidate activity and identify anomalous trends instantly. According to experimental results, the suggested solution successfully balances privacy and usability while identifying possibly fraudulent actions. A thorough performance study and a detailed architectural design provide more details about the framework.

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CHANGING PERSPECTIVES: THE METAMORPHOSING IMAGE OF WOMEN THROUGH ADVERTISEMENTS IN INDIA

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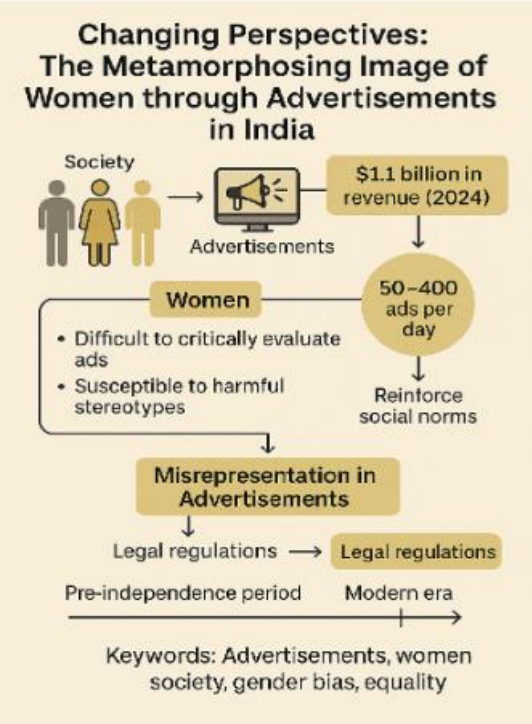
Graphical Abstract



Abstract

Half of the global population is comprised of women, yet they have historically been one of the most marginalized and oppressed groups. Regardless of societal changes or political shifts, women have often been the ones to bear the most significant burdens. One of the primary contributors to this ongoing struggle is the media. In 2024 alone, advertisers generated a massive $1.1 billion in revenue, highlighting the profound influence advertisements have on people & minds. On average, individuals are exposed to between 50 and 400 ads every day, with each advertisement serving two main functions: either reinforcing existing social norms or introducing new ones. Our society is made up of different groups, and half of it is women, who, like everyone else, see these advertisements.

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However, women are often conditioned in ways that make it difficult for them to critically assess the content of these ads. The emotional appeal used in advertisements is particularly compelling, and women, especially in India where education and empowerment levels remain low, are more susceptible to their effects. This lack of awareness and education makes women more vulnerable to the messages conveyed by ads, which may perpetuate harmful stereotypes. This paper will investigate how the misrepresentation of women in advertisements impacts them, as well as the legal regulations in place to address such issues. To provide a thorough analysis, the paper will review advertisements from both the pre-independence period and the modern era.

Keywords: Advertisements, women, society, gender bias, equality.

THE PORTRAYAL OF WOMEN IN VICTORIAN LITERATURE: IDEALS, CONSTRAINTS, AND REBELLION

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Abstract

The Victorian era (1837–1901) marked a pivotal period in literature, culture, and gender dynamics. In this paper, we explore how women were portrayed in Victorian literature, a time when societal expectations rigidly confined women to ideals of domesticity, purity, and obedience. Female characters were often depicted as angelic figures—self-sacrificing, morally upright, and emotionally restrained. However, Victorian literature also presented subtle and overt challenges to these ideals. Writers like Charlotte Bronte, Elizabeth Gaskell, and Thomas Hardy crafted complex female characters who questioned their roles, sought independence, and struggled against social constraints. This paper delves into key themes such as the "angel in the house" trope, the fallen woman narrative, and the emergence of the "New Woman." Through character studies of figures like Jane Eyre, Tess Durbey field, and Margaret Hale, we examine how Victorian literature both reflected and resisted the gender norms of its time. These portrayals not only reveal the cultural tensions surrounding femininity but also laid the groundwork for feminist literary thought. Ultimately, this paper

argues that the representation of women in Victorian literature was far from uniform—it ranged from idealization and subjugation to resistance and empowerment.

Keywords: Victorian literature, gender roles, angel in the house, New Woman, female agency, feminist themes, 19th-century novels

VOICES UNBOUND: THE EVOLVING REPRESENTATION OF WOMEN IN AMERICAN LITERATURE

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Abstract

This paper explores the dynamic representation of women in American literature from the19th century to the present day. It traces how female characters have shifted from passive Figures bound by domestic roles to complex, autonomous individuals asserting their agency. By analyzing works from authors such as Nathaniel Hawthorne, Kate Chopin, Zora Neale Hurston, Toni Morrison, and contemporary voices like Roxane Gay, the paper highlights the literary and cultural forces that shaped these portrayals. This study argues that the representation of women in literature not only reflects changing societal attitudes but also actively challenges and reshapes them, making literature a powerful site of feminist discourse and resistance.

Keywords: Zora Neale Hurston, American literature, Representation of Women in Literature.

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THE PORTRAYAL OF WOMEN IN MEDIA & LITERATURE

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Abstract

The portrayal of women in media and literature has evolved from silent, symbolic figures to bold, complex protagonists who challenge power structures. This presentation explores how gender roles are both reinforced and resisted in various media forms, including streaming content, global literature, and especially Tamil literary works. Tamil literature, from classical epics like Silappatikaram to modern feminist voices, reflects shifting societal views—celebrating women as moral anchors while also exposing their subjugation, objectification, and struggles. The paper examines how these texts navigate themes of honor, agency, class, and caste, offering a culturally grounded feminist lens. By questioning whether today's narratives truly empower women or subtly continue patriarchal ideologies, this talk highlights how representations in stories don't just reflect reality—"They shape it".

Keywords: Women's Representation, Tamil Literature, Feminist Criticism, Intersectionality, Media Narratives, Silappatikaram, Patriarchal Norms, Cultural Identity

THE PORTRAYAL OF WOMEN IN MEDIA

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Abstract

The way women portrayed in media plays a vital role in shaping societal attitudes, beliefs, and cultural norms. This presentation delves into how women have been portrayed over time, focusing on key themes such as characterization, roles and agency, diversity and inclusivity, and their impact on society. The section on characterization explores traditional depictions, such as the concept of Adam's dependency on Eve, which reflects the early acknowledgment of women's significance, even within male-centered narratives. In examining roles and agency, we highlight the transition of women from confined family roles to powerful figures

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in education and innovation. Helen Keller stands as a beacon of educational achievement, proving that disability is not a limitation when paired with determination and support. Likewise, Sunita Williams represents women as pioneers in fields once dominated by men, showing the limitless potential of female ambition. The presentation also emphasizes the growing diversity and inclusivity in media and literature, where women of differentraces, backgrounds, and professions are now gaining visibility and recognition. This shift is crucialin breaking down stereotypes and normalizing representation in all spheres.

Keywords: Characterization, Roles and Agecy, Diversity and inclusitivity, Impact on society.

EMPOWERMENT OR OBJECTIFICATION: AN ANALYSIS OF REPRESENTATION OF MODERN INDIAN -MEDIA

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Abstract

Media plays a powerful role in shaping how society thinks and what it values. This paper looks at how women are shown in different types of media—like TV, print, movies, and online platforms. By studying both past trends and current examples, it reveals how women have often been stereotyped, objectified, or pushed to the sidelines. It also explores how things are changing, thanks to feminist movements, new policies, and a more aware audience. The paper shows that media doesn't just reflect society—it also influences it. That's why it's so important to have fair, diverse, and genuine portrayals of women in media.

Keywords: Women in Media, Gender Representation, Media Stereotypes

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NARRATIVES OF WOMEN IN LITERARY AND MEDIA TEXTS

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Abstract

The portrayal of women in literature and media has significantly evolved, reflecting-changing societal norms, cultural shifts, and feminist movements. Historically, female characters were often confined to traditional roles, reinforcing stereotypes of domesticity, passivity, and subordination. However, modern literature and media have challenged these representations by introducing diverse, complex, and empowered female figures. This steaminess the historical trajectory of women &representation, analyzing key literary texts, films, and digital media. It evaluates the persistence of gender biases, objectification, and under representation while highlighting emerging trends that promote exclusivity and gender equality. The research further explores the impact of these representations on societal perceptions and women's roles in real life. Findings suggest that while progress has beenmade, challenges remain in achieving a truly equitable portrayal of women. This study underscores the need for balanced narratives that move beyond stereotypes, advocating for a more authentic and empowering depiction of women in literature and media.

Keywords: Gender representation, Feminism, Media portrayal, Literature, Women's empowerment.

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IMAGE OF WOMEN IN LITERATURE AND MEDIA

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Abstract

The representation of women in literature and media has been a longstanding concern,with women often being relegated to marginal roles,stereotypes,and tropes.This presentation delves into the way in which women has been portrayed in various literary and media texts,highlighting the limitations and biases that have perpetuated patriarchal norms.The objectification and commodification of women's bodies.The reinforcement of patriarchal stereotypes and tropes.The erasure of women's agency and experience.The emergency of Feminist counter-narratives and resistance.This presentation aims to spark a critical conversation about the ways in which women are portrayed and to imagine alternative narratives that promote exclusivity,diversity,and social justice.

Keywords: Women's-representation, literature, media, feminism, patriarchal norms, counter-narratives.

FEMININE REPRESENTATION IN LITERARY AND MEDIA LANDSCAPES

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Abstract

The representation of women in literature and media has evolved significantly over time, reflecting and shaping societal attitudes toward gender roles. Historically, women were often portrayed through narrow stereotypes—such as the damsel in distress, the devoted wife, or the femme fatale—limiting their agency and complexity. With the rise of feminist movements and increasing gender awareness, contemporary portrayals have begun to embrace more nuanced and diverse female characters. However, challenges remain, including under representation, objectification, and the persistence of gendered clichés. This abstract explores the progression of female representation from traditional literature to modern media,

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analyzing how these portrayals influence public perception, reinforce or resist patriarchal norms, and contribute to ongoing debates about gender equality. It also examines the role of female creators in reshaping narratives and expanding the space for authentic female voices. By highlighting key works and trends across different periods and cultures, the study emphasizes the need for a more inclusive and balanced approach to storytelling. A critical examination of these portrayals not only fosters media literacy but also contributes to the broader pursuit of social justice and equity.

Keywords: Women in literature , Stereotypes , Feminism , Gender roles , Media portrayal, Narrative analysis , Gender equality , Cultural representation , Patriarchy , Objectification , Empowerment , Inclusive storytelling

REPRESENTATION OF WOMEN IN LITERATURE AND MEDIA

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Abstract

The representation of women in literature and media has undergone a significant transformation over the years. From stereotypical and limited portrayals, women are now depicted as complex and empowered individuals with agency and autonomy. This shift reflects changing societal attitudes and cultural norms, where women are no longer confined to traditional roles and expectations. Representation Literary works and media platforms have played a crucial role in shaping cultural attitudes towards women. Authors and creators have used their narratives to explore themes of identity, agency, and social justice, offering insights into the lives and struggles of women across different cultures an… ACT

Keywords: Representation, Women, Literature, Media, Empowerment, Diversity, Inclusion, Identity, Agency, Justice.

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DEPICTIONS OF WOMEN IN SOUTH INDIAN MEDIA

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Abstract

This study examines the decpictions of women in South Indian media, focusing on film and television industries in Tamil Nadu and Kerala. Analyzing popular media texts, this research explores the evolution of women's roles and representations over time, reflecting changing social norms and feminist movements. The study investigates portrayals of women in various contexts, including family dramas, romantic comedies, and action films, highlighting how media narratives reinforce or challenge patriarchal norms. By examining intersections of gender, culture, and power, this research contributes to a deeper understanding of women's representation in South Indian media and its impact on societal attitudes. Key findings include the emergence of strong female characters, the negotiation of traditional roles, and the influence of media on women's empowerment. This study offers insights into the complex nature of femininity in South Indian media.

Keywords: Women's representation, South Indian media, Film studies, Television studies, Gender and culture.

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MATHEMATICAL MODEL FOR THE INFORMATION SOCIETY

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Abstract

The information society thrives on the seamless exchange of data and rapid technological progress, revolutionizing how people interact, communicate, and solve problems. Mathematical models serve as powerful tools to decode the complexities of this digital age, enabling structured analysis of large-scale phenomena and informed decision-making. Among these, aerodynamics stands out as a model that employs logistic equations and agenda-setting theories to explore the diffusion of innovation and the evolution of public opinion. By examining how ideas and technologies spread across interconnected populations, this model sheds light on the dynamics of influence in the digital world. Similarly, the statistical mechanics approach, inspired by thermodynamic principles, provides insights into systems involving vast numbers of interacting entities. It has proven valuable in studying migration patterns, economic crises, and societal shifts. Social process models, on the other hand, focus on the intricate interplay of cognition, behavior, and interaction within the information society. They reveal the mechanisms of social influence, collaboration, and conflict, offering a deeper understanding of the forces shaping modern communities. These mathematical frameworks extend their utility to diverse domains, from urban planning and healthcare to digital governance and education. Policymakers, researchers, and organizations leverage these models to design strategies, optimize resources, and address pressing challenges such as inequality, misinformation, and resource scarcity. By bridging theoretical insights and real-world applications, mathematical models empower societies to adapt to rapid change while fostering innovation and resilience in an era defined by boundless information and digital connectivity. Their role continues to expand, driving progress and understanding in the ever-evolving information landscape.

Keywords: Information society, Mathematical models, Technological progress, Data exchange, Innovation, diffusion, Ideodynamics, Agenda-setting theories, Statistical mechanics, Thermodynamic principles, Migration patterns, Economic crises.

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APPLICATIONS OF DIFFERENTIAL EQUATION IN PHYSIC, BIOLOGY, ENGINEERING AND ECONOMICS

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Abstract

Differentials are an important concept in calculus that help us understand how quantities change. They are not only used in mathematics but also have many applications in other fields such as physics, biology, engineering, and economics. By studying how small changes happen, differentials allow us to analyze and predict the behaviour of various systems in the real world. In physics, differentials are used to study motion, speed, and force. For example, when we want to know how fast an object is moving at a certain time, or how its speed is changing, we use derivatives. They are also used in areas like electricity, heat, and wave motion. In biology, differentials help scientists understand how populations grow, how diseases spread, and how medicines react in the body. These mathematical models are useful in medical research, environmental studies, and health planning.

In engineering, differentials are used in the design and analysis of machines, buildings, and systems. Engineers use differential equations to study how things behave under stress, how heat flows, or how systems respond over time. This helps them create safe and efficient designs. In economics, differentials are used to examine small changes in cost, profit, supply, and demand. Economists use these concepts to study market trends, make predictions, and help businesses make better decisions. Overall, differentials are a useful tool in many subjects. They help connect mathematics with real-world problems by providing a way to measure and understand change. Whether in science, health, technology, or business, differentials play a key role in helping us solve problems and improve our understanding of the world.

Keywords: Differentials are an important concept in calculus,ifferentials help scientists understand.

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MATHEMATICAL MODELS FOR THE INFORMATION SOCIETY

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Abstract

With a focus on their uses in data processing, artificial intelligence, cyber security, and communication networks, this paper examines the importance of mathematical models in the growth of the information society. Mathematical modelling is essential to improve algorithm performance, data security, and decision-making effectiveness as digital technologies develop. The demand for precise, effective, and scalable mathematical models that can process enormous volumes of data, forecast trends, and facilitate real-time decision-making has grown because of our increasing reliance on digital information systems. The influence of mathematical models on sectors like information technology, healthcare, banking, and logistics is demonstrated by a number of case studies. Mathematical models are employed in the financial industry to analyse risk and detect fraud, algorithmic trading as well as detection.

In the medical field, they facilitate patient diagnostics, medical imaging improvements, and predictive analytics for disease outbreaks. In organization, they optimize route planning and supply chain operations. Mathematical frameworks in information technology help with data compression, secure encryption methods, and computational efficiency. This paper concludes by emphasizing the critical role that mathematical models will play in determining the direction of the information society. By increasing automation, fortifying security, and expanding the capacity for data processing required. Their importance will only increase with future developments in artificial intelligence, quantum computing, and big data analytics, making them essential to the ongoing development and effectiveness of the digital age.

Keywords: Mathematical models, Information society, Data processing, Cryptography, Network optimization, Artificial intelligence, Predictive analytics, Computational efficiency.

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MATHEMATICAL MODELS FOR THE INFORMATION SOCIETY

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Abstract

In the era of big data, the information society faces unprecedented challenges in data management, analysis, and ethical governance. This paper examines the pivotal role of mathematical modelling in navigating these complexities. It introduces core modelling techniques—including network analysis, differential equations, statistical methods, and machine learning—and demonstrates their practical application through case studies in social media analysis, cybersecurity threat detection, and smart city optimization. The integration of machine learning enhances model accuracy and adaptability, while ethical concerns such as algorithmic bias and data privacy are critically examined. The paper also highlights emerging trends like quantum computing and federated learning, which are set to shape the future of the field. Ultimately, it calls for interdisciplinary collaboration to ensure responsible, fair, and impact use of modelling in society.

Keywords: Data management, analysis, modelling techniques and machine learning

DIFFERENTIAL EQUATION AND ITS APPLICATION

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Abstract

This study delves into the significance, classification, and solution methods of differential equations, with a special focus on exact differential equations. It emphasizes the pivotal role of ordinary and partial differential equations in modeling dynamic systems across a range of disciplines including physics, biology, engineering, and economics. The paper outlines various types of differential equations—such as linear, non-linear, homogeneous,

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and non-homogeneous—and discusses methods of solution including separation of variables, variation of parameters, and techniques for solving exact and simultaneous equations. A systematic approach to testing for exactness, using integrating factors to convert non-exact equations, and solving exact differential equations step-by-step is presented. Practical applications like exponential growth and decay, vertical motion, and beam deflection are explored through worked examples. The study concludes by emphasizing the importance of analytical solutions while suggesting the use of numerical methods for more complex, real-world systems involving dynamic boundaries and non-linear behaviors.

Keywords: Mathematical Modeling, Exponential Growth and Decay, Beam Deflection, Non-linear Systems, Separation of Variables, Variation of Parameters, Analytical and Numerical Methods.

DIFFERENTIAL EQUATIONS AND THEIR APPLICATIONS

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Abstract

In many branches of science and engineering, dynamic systems are modeled using differential equations and their applications. These equations are essential to physics, engineering, biology, economics and environmental science because they explain how quantities change with respect to time or space. Partial differential equations involve several variables, whereas ordinary differential equations deal with functions of a single variable. They can be used to simulate population dynamics, economic trends, electrical circuit modeling, and planetary motion prediction. The capacity to effectively answer complicated differential equations has improved with advancements. Differential equations have many uses, but they can be difficult to solve due to non linearity, computational complexity, and real-world uncertainty. To increase the precision and effectiveness of solutions, researchers are constantly creating better analytical and numerical methods that incorporate machine learning and quantum computing.

Key words: dynamic system, engineering, physics, biology, economic, numerical methods.

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REPRESENTATION OF NANOTECHNOLOGY IN MODERN INDUSTRY

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Abstract

Nanotechnology, contrary to its name, has massively revolutionized industries around the world. This paper predominantly deals with data regarding the applications of nanotechnology in the modernization of several industries. A comprehensive research strategy is adopted to incorporate the latest data driven from major science platforms. Repentantly, a broad-spectrum overview is presented which comprises the diverse applications of nano technology in modern industries.

This study reveals that nanotechnology is not limited to research labs or small-scale manufacturing units of nano medicine, but instead has taken a major share in different industries. Companies around theworld are now trying to make their innovations more efficient in terms of structuring, working, and designing outlook and productivity by taking advantage of nanotechnology. From small-scale manufacturing and processing units such as those in agriculture, food, and medicine industries to larger-scale production units such as those operating in industries of automobiles, civil engineering, and environmental management, nanotechnology has manifested the modernization of almost every industrial domain on a global scale. With pronounced cooperation among researchers, industrialists, scientists, technologists, environmentalists, and educationists, the more sustainable development of nano-based industries can bepredicted in the future.

Keywords: nanotechnology; nanoindustries; agriculture; foods; medicine; textile; biotechnology; construction; environment; automobiles; cosmetics industry.

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IMPACT OF NANO SCIENCE ON DRUGS

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Abstract

Nanoscience, the study of materials at the atomic and molecular scale, has ushered in a new era in drug development and medical therapeutics. This presentation delves into the transformative influence of nanotechnology on the pharmaceuticall and scape, focusing on its applications in drug delivery, treatment efficacy, and patient outcomes. At the heart of this innovation lies the ability to manipulate matter at the nano scale, which enables the creation of drug delivery systems that are more precise, effective, and personalized. Key advancements discussed include the use of nano particles for targeted drug delivery, allowing medications to reach specific cells or tissues while minimizing adverse effects on healthy ones. This is particularly beneficial in on cology, where nano carriers can enhance the localized concentration of chemotherapeutic agents. Additionally, nano science has revolutionized the solubility and bioavailability of poorly soluble drugs, enabling controlled release mechanisms that improve dosing schedules and patient compliance.

The presentation also highlights cutting-edge research in nano-therapeutics, such as the role of nano materials in overcoming antibiotic cresistance, advancing vaccine technologies, and enabling real-time diagnostics through nano-imaging agents. Despite these remarkable innovations, challenges persist. Issues surrounding biocompatibility, long-term toxicity, and regulatory hurdles are explored, underscoring the importance of robust safety studies and clear policy frameworks. Looking ahead, the field promises significant growth, particularly in the realms of personalized medicine and chronic disease management. As nano science continues to evolve, it is poised to not only redefine drug design and delivery but also tos hape the future of global healthcare.

Keywords: nanoparticles, nanocarriers,carbon nanotubes, nanoemulsions

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NANO- TECHNOLOGY IN FOOD PROCESSING AND FOOD PACKAGING

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Abstract

Foods are highly susceptible to spoilage making them unacceptable for consumers. Food packaging is the critical point in proper handling and maintenance of food quality. Traditional food packaging has four basic functions: protection or preservation, containment, convenience, and communication. Improvements are made in these basic functions to design improved, active, and smart packaging. Passive or traditional food packaging is nowadays turning towards active or innovative food packaging by incorporating the use of nanotechnology to produce clever, interactive, and responsive food packaging with improved functionalities.

Nano materials and edible coatings added with nano particles are more advantageous than conventional packaging materials in providing better preservation and quality maintenance of food products. Nano particles can modify the physical and mechanical properties of packaging polymer by improving their strength, durability, flexibility, barrier, and reusing properties. Enhancement of vapor and gas barrier properties by the incorporation of nano-fillers, anti-microbial properties of nano-composite films, nano-sensors-based smart packaging are some ways by which nanotechnology can improve the quality and safety of foods through packaging.

Keywords: Traditional food packaging, Smart packaging, Nano technology, Nano- materials in packaging and processing.

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FROM SCI-FI TO SKY: THE REALITIES OF METAMATERIAL-BASED STEALTHAIRCRAFT

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Abstract

Stealth technology has long been a critical factor in modern military aviation, with efforts focusing on reducing radar cross-section (RCS) and infrared signatures. Metamaterials engineered structures with unique electromagnetic properties are emerging as a potential break through in stealth technology. This paper explores the role of meta materials in stealthair craft, their ability to achieve near-perfect cloaking, and the challenges that remain in making aircraft completely undetectable. By analyzing recent advancements in metamaterials, radar absorption, and stealth coatings, this research evaluates whether metamaterials can fully conceal next-generation stealth aircraft from detection systems. The integration of nanostructured metamaterials into aircraft surfaces presents promising prospects for broadband stealth across multiple detection spectra. Additionally, this study highlights the interplay between meta material design and emerging detection technologies such as quantum radar, emphasizing the evolving nature of the stealth-detection arms race.

Keywords: Metamaterials, Stealth technology, Radar cross-section (RCS) reduction, Electromagnetic wave manipulation, Multispectral cloaking, Radar-absorbing materials (RAM), Stealth aircraft, Infrared suppression, Quantum radar evasion, Metasurfaces, Electromagnetic stealth, Nano structured materials

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LIGHT POLLUTION AND ITS IMPACT

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Abstract

Light pollution—the excessive or poorly directed use of artificial light—is an increasingly serious environmental issue, affecting over 80% of the worlds population who now live under light-polluted skies is a growing concern with profound implications. This presentation delves into the multifaceted impacts of light pollution, from disrupting nocturnal wild life behavior to obscuring our view of the stars. It explores how artificial lighting interferes with ecosystems, alters predator-prey dynamics, and contributes to biodiversity loss. It highlights on how it works with human circadian rhythm, impairs sleep, increases risks of health conditions like breast cancer, and diminishes mental well-being. Furthermore, the session examines the challenges of measuring the light pollution and its role in exacerbating urban air quality problems, such as sky glow and the destruction of nitrate radicals, which exacerbates air pollution. The talk also presents practical mitigation strategies—including efficient lighting, policy changes, and public engagement—to reclaim the night sky,protect natural ecosystems, and improve quality of life.

Keywords: Pollution, Artificial lighting, Light trespass, Ecosystem disruption, Glare, Sky glow.

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NANO TECHNOLOGY MODERN MATERIALS RECENT TRENDS AND APPLICATION

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ABSTRACT

Nanotechnology, the science of manipulating matter at the atomic and molecular scale, is revolutionizing material science and engineering. This presentation provides a comprehensive overview of nanotechnology, focusing on modern materials, recent research trends, and a broad range of applications. Key innovations such as graphene and nano composites are explored for their unique mechanical, electrical, and thermal properties. Recent developments highlight the integration of artificial intelligence, nano scale 3D printing, and biomimicry, signaling a new era of smart material design. Practical applications are examined across fields including medicine, electronics, environmental remediation, and energy systems, showcasing breakthroughs in targeted drug delivery, nano electronics, water purification, and energy storage. While nano technology promises transformative impacts, it also raises challenges related to toxicity, regulation, and ethics. The presentation concludes with an outlook on the future of nanotechnology, emphasizing interdisciplinary collaboration, sustainable development, and continued innovation.

Keywords: Nano electronics,Nano material and medicine.

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THE INFRINGEMENT OF CHEMICALS IN BRAIN CHIPS

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ABSTRACT

In the fast-evolving realm of neuroscience and technology, brain chip integration is emerging as a groundbreaking innovation. These cutting-edge devices, engineered to interact directly with the human brain, offer remarkable possibilities for enhancing cognitive functions and restoring lost capabilities. This abstract explores the expanding field of brain chips, highlighting their applications and impact across multiple domains. From augmenting mental performance to enabling new forms of human-machine interaction, these advancements are redefining neuro technology. This study investigates the current progress in brain chipd evelopment, their use in healthcare, communication and neural interfaces. As we advance into this new era, it is essential to assess both the opportunities and challenges associated with brain chip technology to maximize its benefits while addressing ethical concerns.

Keywords: Brain Chip Technology, Neural Interfaces, Human-Machine Interfaces, Neural Implants, Neurological Disorders.

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THE TRENDS OF DECOMPOSITION OF PLASTIC BY USING BEETLES

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Abstract

Plastic poses a persistent threat to people and a variety of other creatures, especially those that live in terrestrial and aquatic environments, due to its long environmental half-life. Ithas been established those traditional methods of disposing of plastic garbage, such disposing of it in landfills and employing chemical processes, are ineffective and significantly harm the ecology. When plastics are allowed to break down naturally, they show a great resistance tothis process. Insect-induced polymer degradation is currently not useful. While the idea thatinsects break down plastics is well known, the specific process by which this happens is still partly unknown. Additionally, using insect larvae to break down plastics has the benefits of being inexpensive and producing no secondary pollution. The current analysis provides thorough summary of the most recent studies, particularly examine how insects and microbes break down plastic. This review &objective is to shed light on the mechanisms by which insect sand environmental microbes break down plastic. It also highlights the most recent cutting-edge perspectives on the potential applications of plastic bio degradation, as well as the difficulties and opportunities facing this field going forward.

Keywords: PAH-Polycyclic aromatic hydrocarbons, PCB-polychlorinated biphenyl, PE-polyethylene, PET-polyethylene terephthalate

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MECHANISMS, DIAGNOSIS, AND THERAPEUTIC APPROACH OF SENSITIVE SKIN

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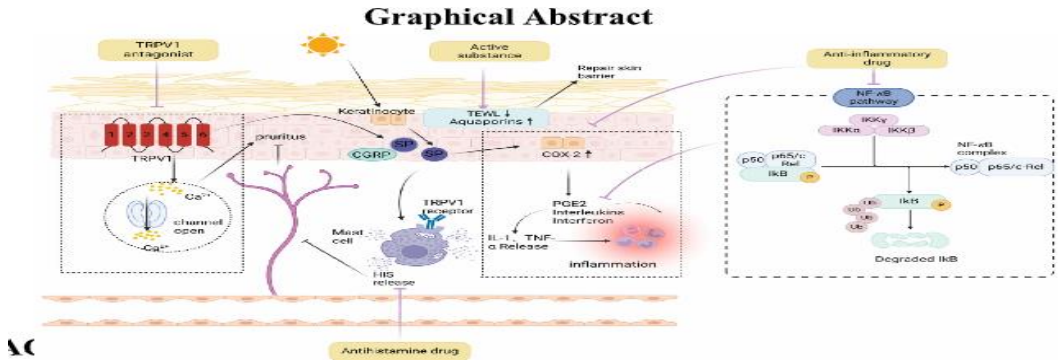
Graphical Abstract



ABSTRACT

A hyper-reactive state of the skin, mainly on the face, is the hallmark of sensitive skin, a clinical illness. Subjective symptoms like burning, stinging, itching, and tightness in response to chemical, physical, or psychological stimuli are present. Objective indicators like scales, erythema, and dilated blood vessels may or may not might notexist. Numerous endogenous and exogenous elements, which typically do not have amajor impact on the individual and do not cause irritating reactions, might cause the pain associated with sensitive skin. Research and care for sensitive skin are complicated by the fact that sensitive skin frequently manifests as a subjective condition with no clinical symptoms and varies widely. Diagnostic advancements, including biomarker identification, quantitative sensory testing, and imaging techniques, have improved the ability to assess sensitive skin conditions objectively. Treatment strategies focus on restoring barrier function through lipid-rich formulations, anti-inflammatory agents, and micro biome-friendly skincare. Novel therapies, such as nutria cosmetics and pro biotic-based treatments, show promise in regulating skin responses. This research aims to provide an in-depth understanding of sensitive skin &

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biological and clinical aspects,paving the way for innovative therapeutic approaches and personalized skin care solutions.

Keywords: Sensitive skin, skin barrier dysfunction, neuro sensory hyper reactivity, inflammation, biomarker analysis, skincare, micro biome.

APPLICATIONS OF BIOMEDICAL NANOMATERIALS IN TISSUE ENGINEERING

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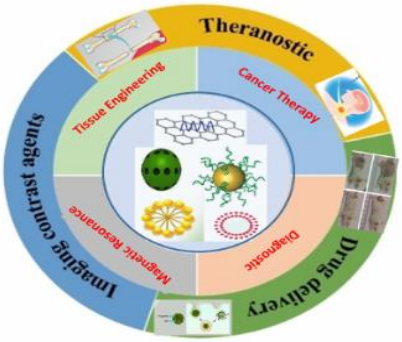
Graphical Abstract



ABSTRACT

Tissue engineering, which has been utilized to create intelligent medication delivery systems and repair or rebuild damaged tissues or organs, has greatly benefited from recent advances in nanotechnology. Given the wide range of tissue engineering applications for nanomaterials, it is critical to select the right nanoparticles for each application due totissue heterogeneity. In fact, the decision directly affects how nanoparticles are used intissue engineering. In our analysis, we primarily introduced tissue engineering using nanoparticles. Following a brief introduction to the fundamental properties, techniques of synthesis, and characterization of the many types of nanomaterials, a thorough anexplanation of the use and development of nanomaterials in medication delivery and tissue engineering. Lastly, the

current difficulties and potential future uses of nano materials in tissue engineering are examined.

Keywords: Nanomaterial, Biomaterial, Tissue engineering, Regenerative medicine.

CYBERSECURITY THREATS ON THE INTERNET OF THINGS (IOT): IOT THREATS,ENCRYPTION, DATA BREACHES, NETWORK SECURITY

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ABSTRACT

The rapid growth of the Internet of Things (IoT) has brought unprecedented opportunities for innovation, but it has also introduced significant cyber security vulnerabilities. IoT devices, ranging from smart home appliances to industrial sensors, are increasingly integrated into daily life, creating new attack surfaces for cybercriminals. This paper explores the evolving cyber security threats posed by IoT, emphasizing the challenges of securing billions of interconnected devices that often operate with limited computational resources and minimal security protocols. Common threats, including botnet attacks, data breaches, and Denial of Service (DoS) attacks, are discussed, along with their potential impact on individuals,businesses, and governments. The paper reviews existing security mechanisms, such as encryption, authentication, and device hardening, and evaluates their effectiveness inmitigating IoT-specific risks. Additionally, the role of standards and regulations in shaping IoT security practices is examined. The paper concludes with a discussion on the need for a comprehensive security framework that includes secure device design, proactive monitoring, and user education to address the growing cybersecurity challenges within IoT ecosystems.

Keywords: Cyber attacks, IoT Threats, Encryption, Smart Device Security

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AI-POWERED PHISHING DETECTION SYSTEM

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ABSTRACT

Phishing attacks, often initiated through malicious URLs, pose a significant cyber security threat. This paper presents a purely API-driven, AI-powered system designed for the real-time detection of phishing URLs. The system employs advanced machine learning models, specifically optimized for URL analysis, and leverages the Groq API for ultra-low latency inference. This approach enables rapid and saleable detection of malicious URLs, facilitating integration into various security applications. The paper details the system architecture, the selection and engineering of URL-specific features, the optimization of the chosen model for the Groq API, and the performance evaluation, demonstrating the APIs effectiveness in identifying phishing URLs with high accuracy and speed. The system& design emphasizes ease of integration and real-time responsiveness, addressing the critical need for timely phishing detection in today& digital landscape.

Keywords: Phishing Detection, Malicious URL Detection, AI API, Groq API, Real-time URL Analysis, Cybersecurity, API-driven Security, Machine Learning, URL Features.

RESPONSIBLE AI AND ROBOTICS IN SPACE EXPLORATION

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ABSTRACT

An era of exploration is emerging, and it brings with it the reality that robotics and AI will not only be tools; they will be important contributors to exploration. These technologies are changing how we explore space, from environments and planets that are far away to space systems that can fix satellites without care. The conversation delves further into the ethical considerations of AI-driven space robotics. We propose how judgement can remain at the forefront of the mission. Most importantly, we argue that human-robot collaboration, and not

replacement must drive innovation. AI could be imbued with accountability and explain ability by design, and if fail-safes can also be designed into a system, then even more unintentional harm can be avoided, and we can extend the frontiers of discovery. The vision of AI future in which exploration is still bold, ethical, and fundamentally human even when machines are doing the heavy lifting. As space agencies and private companies increasingly rely on Artificial Intelligence (AI) and Robotics for space exploration, a new frontier of ethical challenges and opportunities emerges. This paper examines the responsible development and deployment of AI and robotics in space exploration, focusing on ethical concerns such as accountability, transparency, and human autonomy. We explore the potential risks and benefits of AI-driven decision-making in space missions, including the use of autonomous robots and AI-powered navigation systems. Furthermore, we discuss the need for international cooperation and regulation to ensure that AI and robotics are developed and used responsibly in space exploration. Our analysis highlights the importance of addressing these ethical challenges to ensure that the benefits of AI and robotics in space exploration are equitably distributed and that their risks are mitigated.

Keywords: Responsible AI, Robotics, Space Exploration, Ethics, Accountability, Transparency, Human-Robot collaboration

BLOCKCHAIN WITH INTERNET OF THINGS: BENEFITS, CHALLENGES, AND FUTURE DIRECTIONS

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ABSTRACT

The Internet of Things (IoT) has expanded internet connectivity beyond computers and humans to include various objects in our environment. With the ability to connect billions of devices, IoT enhances information sharing and improves our daily lives. However, its centralized server-client model presents challenges such as scalability and security risks, as all devices must connect through a central server, creating a single point of failure. A decentralized approach, such as blockchain, can address these challenges. Blockchain

technology enhances security and efficiency by removing reliance on a central authority. This paper explores how integrating blockchain with IoT can solve key challenges, highlighting its benefits, potential obstacles, and future research directions. We conclude that combining blockchain and IoT can enable new business models and innovative applications.

Keywords: Blockchain, IoT, Decentralization, Security.

EDGE-CLOUD COMPUTING SYSTEMS FOR SMART GRID: STATE-OF-THE-ART, ARCHITECTURE, AND APPLICATIONS

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ABSTRACT

The rapid proliferation and increasing diversity of intelligent energy generation and consumption devices in smart grids have imposed substantial demands on traditional cloud computing (CC) infrastructures, particularly in real-time data processing and control. To address these challenges, the integration of edge computing (EC) emerges as a promising solution by enabling localized, low-latency processing and enhanced data security. This paper presents a comprehensive review of the EC-CC hybrid computing paradigm and its application within the smart grid ecosystem. It begins by clarifying the conceptual distinctions and interrelations among cloud computing, fog computing (FC), and edge computing, establishing a theoretical foundation for system design. The architecture of the EC-CC framework is then detailed, covering both hardware configurations and software platforms, along with enabling technologies that support its functionalities. Furthermore, the paper explores the application of this architecture across the full smart grid value chain—spanning energy generation, transmission and distribution networks, and end-user consumption. Finally, key challenges and future research directions are discussed to guide academic inquiry and industrial innovation. This study provides critical insights for advancing the development of efficient, secure, and scalable smart grids in line with global transitions toward decarbonization, digitalization, and decentralization. Index Terms— Smart

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grid, edge computing, fog computing, cloud computing, Internet of Things, data fusion, container technology.

Keywords: Computing, transmission and distribution networks, decarbonization, digitalization, and decentralization.

GRAPH THEORY AND COMPUTATIONAL STATISTICS

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ABSTRACT

This work explores the intersection of graph theory and computational statistics, emphasizing their synergistic role in analyzing complex data structures. Graphs serve as powerful tools for modeling relationships and dependencies within datasets, from social networks to biological systems. We examine statistical methods for inference on graph-based models, including Markov Random Fields, Bayesian networks, and graph-based clustering. Through computational techniques such as Monte Carlo simulations, spectral graph theory, and graph neural networks, we demonstrate how statistical properties can be efficiently estimated and leveraged for pattern detection, anomaly identification, and predictive modeling. This integration offers a robust framework for uncovering latent structure in high-dimensional and interconnected data, paving the way for more interpretable and scalable analytics in diverse scientific dominains.

Keywords: Social networks to biological systems,spectral graph theory, scalable analytics in diverse scientific dominains.

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GRAPH THEORY AND ITS USES IN REAL LIFE

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ABSTRACT

Graph theory is a fundamental area of mathematics that studies the properties and applications of graphs—structures made up of nodes (or vertices) connected by edges. Originating from the famous Königsberg bridge problem, graph theory has grown into a vital tool in various scientific and practical fields. This paper explores the core concepts of graph theory and highlights its real-world applications, including computer science (network design, algorithms, and data structures), transportation (route optimization and traffic flow), social networks (connection mapping and influence spread), biology (neural networks and protein interaction), and more. By examining these diverse applications, the study emphasizes the importance of graph theory in solving complex problems and optimizing systems in everyday life.

Keywords: Königsberg bridge problem, social networks, solving complex problems, optimizing systems

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A EMPIRICAL STUDY ON EMPLOYEE HEALTH & SAFETY MEASURES AT FARIDA SHOES PRIVATE LIMITED, AMBUR.

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Abstract

The project report deals with the research topic '**A Empirical Study On Employee Health & Safety Measures at Farida Shoes Private Limited, Ambur, and Tirupattur district'.** The purpose of the research is to find the Employee health and safety is critical aspects of workplace management, particularly in manufacturing industries like footwear production. At Farida Shoes Pvt Ltd., a structured approach to occupational health and safety is implanted to ensure a safe working environment, prevent workplace hazards, and promote employee well-being.The researches follow a descriptive approach and employee's probability sampling techniques. The total population for the study is 1000, from which a sample size 300 has been selected. Primary data was collected directly from the employees through the questionnaires, while secondary data was sourced from books, articles and websites. The questionnaire included various measurement scales such a nominal scale, likert scale, ordinal scale, dichotomous scale to effectively gather data. A random sampling method was applied, and statistical tools like ANOVA, Chi square test, and correlation analysis were used for data analysis.Though this study it was found that respondents were unaware about work place safety, so now management provides them training program on health and safety welfare measures. By analyzing the data collected, the study aims to create as safe work environment that supports employee health and safety initiatives.

Keywords: Health, Safety, Employee, Questionnaires, Environment and Sampling Techniques.

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AN EMPIRICAL STUDY ON EMPLOYEEE COMMITMENT & MORALEAT DISTRICT COOPERATIVE MILK PRODUCER UNION LTD (AAVIN) KRISHNAGIRI.

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Abstract

The project report deals with the research topic **"A STUDY ON EMPLOYEE COMMITMENT AND MORALE TOWARDS THE MILK PRODUCTION UNION LIMITED, (AAVIN) KRISHNAGIRI.** The aim is to find out the level of commitment and morale of the employees. The main objective is to study and understand the influence of the level of morale & commitment on the employees and to study how the employees are committed with the facilities provided in the company. For this project the primary data has been collected directly from the respondents using a questionnaire while the secondary data was collected from books, articles and websites. In this study, a questionnaire was used to collect data from the sample. The study used is convenience sampling technique. The sample size taken for the study is 200. The population size is 420.The research design tool utilized in this study is descriptive analysis, using sampling method of probability method to serve as a robust method for interpreting survey data. Data has been studied and analyzed through statistical tools like correlation and Chi-square test.Various findings have been found through the study and suggested to the management. Through descriptive statistics, and questionnaire based on likert scale and Dichotomous scale. The study seeks to summarize employee perception on commitment and their morale values. By analyzing survey response quantitatively, the research aims to identify trends, patterns, and correlation that shed light on the effectiveness of employee morale and organizational commitment.

Keywords: Employee commitment, morale, correlation, Chi-square test, convenience sampling techniques, data collection, population.

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THE ROLE OF ORGANIZATION CHANGE MANAGEMENT ON EMPLOYEES OF SHRI PKP SPINTEX MILLS PRIVATE LIMITED

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Abstract

The aim of the study is to assess **"The Role of Organization Change Management On Employees** "programs in enhancing employee awareness with **SHRI PKP SPINTEX MILLS PRIVATE LIMITED** Organizational change is a constant in today's rapidly evolving business environment. Change management plays a crucial role in facilitating smooth transitions and ensuring that both employees and organizations can adapt effectively to new processes, structures, and cultures. This study investigates the role of organizational change management Organization Change Management in influencing employee behaviour, attitudes, and performance during periods of change. Data was collected through primary and secondary data with the total population of 500 and sample size is 150 to capture qualitative insight. The sampling method used was stratified random sampling, ensuring representation across departments, genders, and hierarchical levels.

Quantitative data was analyzed using paired **correlation** to measure changes in employee attitudes and **ANOVA** to compare differences across demographic groups. The research employs both qualitative and quantitative methods, including surveys, interviews, and case studies from organizations that have undergone significant change processes. Key findings suggest that transparent communication, active leadership support, and inclusive decision-making practices significantly reduce resistance to change. The study concludes by providing actionable recommendations for organizations to develop robust Organization Change Management strategies tailored to their specific needs. By aligning Organization Change Management practices with employee needs and organizational goals, companies can foster a more adaptive, resilient, and motivated workforce during times of change.

Keywords: Organizational Change Management, Employee Adaptation**,**

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A STUDY ON EMPLOYEE JOB STATISFACTION WITH REFERENCETO BRIGHTGEEKS PRIVATE LIMITED BANGALORE

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Abstract

This project deals with the research topic "A study of employee job satisfaction within organizations towards the Bright geek's private limited, Bangalore". Job satisfaction, defined as the overall contentment employees feel with their work and the workplace environment, is a key driver of employee engagement, productivity, and retention. Employee satisfaction is a critical factor in organizational success, influencing productivity, retention, and overall performance and explores the factors contributing to it. Through a mixed-methods approach including surveys, interviews, and observations, data was collected from a sample of employees across various departments.

The study investigates key dimensions of employee satisfaction such as job satisfaction, work-life balance, communication effectiveness, career development opportunities, leadership quality, and employee benefits. Employee job satisfaction is a critical aspect of organizational performance, influencing productivity, turnover, and overall well-being. Including job characteristics, organizational culture, leadership style, and demographic variables. A mixed-methods approach was employed, combining survey data from 120 employees. Research design is used descriptive analysis and data collection by primary data and secondary data and the survey conducted and by statististical tools percentage chi square correlation and alsoby ANOVAs. That contributes to the existing to organisation seeking to improve well-being and performance.

Keywords: Employee job satisfaction, Organizational performance, Organizational culture, Leadership style, career development opportunities.

ISBN: 978-93-48505-24-8

A STUDY ON IMPACT OF WORK LIFE BALANCE ON EMPLOYEES PRODUCTIVITY WITH REFENCES TO RUCHA ENGINEERING PVT. LT.

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Abstract

Work-life balance plays a crucial role in employee productivity particularly in industrial sectors like automotive manufacturing. This study analyzes the impact of work-life balance on employees at Rucha Engineers Pvt. Ltd., a leading automotive component manufacturer with a workforce of 300 employees. The research focuses on factors such as workload, flexible work policies, and organizational support to assess their influence on productivity and job satisfaction. A sample size of 160 employees was selected for this study using structured surveys and interviews. The research employs both quantitative and qualitative tools, including employee satisfaction surveys, performance metrics, and focus group discussions.

The company's core strategies, such as continuous improvement (TPM), research and development (R&D) for sustainable technologies, and a structured work environment, are analyzed to understand their role in employee well-being. The findings provide insights into the importance of maintaining a balance between professional and personal life, leading to increased efficiency, reduced stress, and higher employee retention. The study aims to offer recommendations for improving work-life balance policies at Ruche Engineers Pvt. Ltd., ensuring long-term organizational growth and employee satisfaction.

Keywords: Work-life balance, employee productivity, organizational strategy, job satisfaction, workforce efficiency, continuous improvement, sustainable work environment.

ISBN: 978-93-48505-24-8

A STUDY ON IMPACT OF AI ON SELECTION AND RECRUITMENT PROCESS WITH REFENCE TO RINEX TECHNOLOGIES PVT. LTD, BANGALORE.

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Abstract

A project reports deals with the research topic **"A STUDY ON IMPACT OF AI ON SELECTION AND RECRUITEMENT PROCESSTOWARDS RINEX TECHNOLOGY PRIVATE LIMITED, BANGALORE**". To investigate the impact of Artificial Intelligence (AI) on the selection and recruitment process, examining its effects on recruitment outcomes, candidate experiences, and organizational efficiency. This study employed a, combining surveys, interviews, and case studies to gather data from HR professionals, recruitment experts, and organizations leveraging AI in recruitment. For this project the primary data has been collected directly from the respondents using a questionnaire while the secondary data was collected from books, articles, and websites. In this study a questionnaire was used to collect data from the sample. The study used random sampling techniques. The sample size taken from the study is 187,as determined from the population of 350 employees. The quantitative tool utilized in this study is descriptive analysis, by analyzing survey response quantitatively, the research aims to identify and balancing AI and human involvement in recruitment. The statistical tools used by chi-square, correlation. The study revealed that AI enhances recruitment efficiency, reduces bias, and improves candidate matching. However, concerns regarding data privacy, transparency, and accountability emerged. This research contributes to the understanding of AI's role in recruitment, highlighting its potential benefits and challenges. The findings inform HR practitioners, policymakers, and organizations seeking to harness AI's potential while mitigating its risks.

Keywords: Artificial Intelligence, Talent Acquisition, Resume Screening, Candidate Experience, Hr Technology, Ethical AI.

ISBN: 978-93-48505-24-8

A STUDY ON IMPACT OF ORGANIZATIONAL CULTURE ON CHANGE INITIATIVE WITH ENDEKA CERAMICS INDUSTRY, HOSUR.

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Abstract

There search is on the basis of "Corporation Multinational organization undergoing significant transformation. The study aims to understand how cultural factors such as communication, leadership styles, and employee attitudes affect the implementation and acceptance of change. Mixed-method research design was employed, combining qualitative and quantitative approaches to gather comprehensive insights. Primary data was collected through employee with the total population is 500andsamplesizeis 150.Thesampling method used was stratified random sampling to ensure representation across departments, roles, and hierarchical levels. Secondary data was obtained from company reports, Magazine, journal, and performance metrics.

Quantitative data was analyzed using descriptive statistics to summarize employee perceptions and inferential statistics regression analysis and ANOVA to identify relationships between cultural dimensions and change outcomes. Qualitative data was analyzed using the mastic analysis to uncover recurring patterns and themes related to employee adaptation and resistance. Key findings indicate that a collaborative and transparent organizational culture significantly enhances employee buy-in and reduces resistance to change. Conversely, hierarchical and rigid cultures were found to hinder effective change implementation. The study concludes that fostering a culture of open communication, employee involvement, and adaptive leadership is critical for the success of change initiatives.

Keywords: Multinational organization, employee involvement, communication

ISBN: 978-93-48505-24-8

A STUDY ON EMPLOYEE PERFORMANCE APPRAISAL REFERENCE TO GRB, HOSUR.

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Abstract

This project examines the effectiveness of "Employee Performance Appraisal in GRB" Organization, focusing on their impact on fairness, transparency, and employee motivation. The study aims to identify gaps in the current appraisal process and propose strategies to enhance its effectiveness in driving employee performance and engagement.The data were collected from both primary and secondary data. The primary data will be collected from the employees through observation, survey and interview method. Secondary data is collected from various journals, articles, websites, and company records. The total number of employees in the organization is 500. The studies have gone through questionnaires of 150 respondents under the research methodology used in Descriptive analyze.

The sampling method used was stratified random sampling, ensuring representation across departments, genders, and hierarchical levels. Quantitative data was analyzed using paired correlation to measure changes in employee attitudes and ANOVA to compare differences across demographic groups.Quantitative data was analyzed using descriptive statistics to summarize employee perceptions to identify relationships between appraisal fairness, transparency, and employee motivation. Key findings indicate that while the appraisal system is generally perceived as fair, employees expressed concerns about the lack of transparency in evaluation criteria and limited feedback for improvement. Managers highlighted challenges in aligning appraisal outcomes with organizational goals.

Keywords: Employee Performance Appraisal, Performance Management, Appraisal Fairness, Transparency, Employee Motivation, Organizational Goals, Employee Engagement.

ISBN: 978-93-48505-24-8

A STUDY ON GRIEVANCE HANDLING TECHNIQUES ADOPTED IN SCHAEFFLER INDIA LTD, HOSUR.

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Abstract

This study titled **"A Study on Grievance Handling Techniques Adopted in Schaeffer India Limited, Hosur"** aims to examine the methods and practices used by the organization to address employee grievances effectively. Grievance handling is a vital part of human resource management as it directly influences employee satisfaction, workplace morale, and overall organizational performance. Schaeffer India Limited, Hosur, a key player in the automotive and industrial manufacturing sector, has adopted a structured and multi-layered grievance redressal system.

The company's grievance mechanisms include formal procedures, employee open complaints under the POSHA title study utilizes employee feedback, internal documentation, and HR policy reviews to evaluate the effectiveness of these techniques. Findings suggest that the company's emphasis on transparency, confidentiality, and timely resolution has led to a more supportive work environment. The involvement of HR and senior management ensures accountability and fosters trust among employees. The study concludes that Schaeffer India Limited's approach to grievance handling serves as a model for other organizations striving to build a positive and responsive workplace culture.

Keywords: Grievance handling, employee perceptions, conflict resolution, workplace relationships, employee satisfaction.

ISBN: 978-93-48505-24-8

A STUDY ON EFFECTIVENESS OFTALENT MANAGEMENTAND DEVELOPMENT OF EMPLOYEE PRACTICES WITH REFERENCE TO MULTI BOARD LINE INDUSTRY BANGLORE.

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Abstract

The study aims to identify gaps in the current talent management processes and propose actionable strategies to enhance employee development, retention, and overall organizational performance. The research adopts a mixed- method approach, combining qualitative and quantitative data collection techniques. Primary data was gathered through Employee with the total population is 500 and sample size is 150. Secondary data was collected from company records, books, magazine, performance reviews, and turnover rates. The data was analyzed using descriptive statistics to summarize employee perceptions and inferential statistics correlation analysis and regression analysis to identify relationships between talent management practices and employee satisfaction, retention, and performance.

Additionally, thematic analysis was used to interpret qualitative insights from interviews. Employees expressed a strong desire for continuous learning opportunities and clearer career progression paths. Based on the analysis, the study recommends implementing a competency-based training framework, introducing mentorship programs, and leveraging, talent analytics to align employee development with organizational goals. These strategies are expected to enhance employee engagement, reduce turnover, and improve overall productivity. This research provides valuable insights for manufacturing firms, particularly in the packaging industry, seeking to optimize their talent management practices in a competitive market.

Keywords: Talent Management, Employee Development, Workforce Retention, Training and Development, Employee Engagement.

ISBN: 978-93-48505-24-8

A STUDY ON HUMAN RESOURCES PRACTICES WITH REFERENCE TO GABRIEL INDIA LTD HOSUR.

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Abstract

The project report deals with the research topic "A study on Human Resource practices towards the Gabriel India Ltd, Hosur". The main aim to establish that employee growth satisfaction and productivity. For this project the primary data has been collected directly from the respondents using a questionnaire while the secondary data was collected from books, articles and websites. In an organization implemented effective human resource practices to drive business success. The organization's HR practices findings highlights focus on recruitment and selection, training and development, performance management, and employee engagement.

The company uses employee referrals, campus recruitment, and online job portals to attract top talent. Comprehensive training programs are provided to employees including technical, behavioral, and leadership development. Regular performance evaluations, feedback, and coaching are conducted to enhance employee performance. Additionally, various employee engagement initiatives, such as recognition programs, team-building activities, and open communication channels, are implemented to foster a positive work environment. While the company has made significant strides in its HR practices, , employee well-being, and leadership development, Questionnaire was used to collect data from the sample and used random sampling techniques. The sample size taken for the study 150 and the quantitative tool utilized in the study is descriptive analysis.

Keywords: Recruitment and selection, Training and development, performance management, employee engagement, evaluation and feedback.

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A STUDY ON THE ROLE OF AI IN COST EFFECTIVE RECIRIUITMENT TO GOODWILL FABRICS PVT LTD., DHARMAPURI

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Abstract

The research is on the basis of "**A STUDY ON THE ROLE OF AI IN COST EFFECTIVE RECIRIUITMENT TO GOODWILL FABRICS PVT LTD., DHARMAPURI"** This study examines the impact of artificial intelligence (AI) on optimizing recruitment processes to enhance cost efficiency and hiring effectiveness within a leading technology firm. A quasi-experimental research design was employed, comparing pre- and post-implementation outcomes of AI-driven recruitment solutions. Data was collected through both primary and secondary sources, with a total workforce of 525 employees and a sample size of 217 to capture qualitative insights. A stratified random sampling method was used to ensure representation across departments, experience levels, and job roles. Quantitative data was analysed using paired z-tests to measure changes in recruitment efficiency, while ANOVA was applied to compare differences across demographic groups.

Additionally, qualitative data from focus groups was systematically analysed to identify recurring themes related to AI's effectiveness in streamlining hiring processes. Key findings indicate that AI significantly improved recruitment efficiency by reducing time-to-hire, enhancing candidate-job matching accuracy, and lowering overall hiring costs. However, the long-term impact varied, with some employees expressing concerns about AI-driven decision-making and the need for human oversight. The study concludes that while AI is effective in improving cost efficiency, its success depends on integrating it with human judgment and ethical recruitment practices. This research provides valuable insights for organizations seeking to leverage AI for cost-effective and inclusive recruitment strategies.

Keywords: Artificial Intelligence (AI),Recruitment Optimization,Hiring Efficiency, Resume screening, Talent aquatint,HR Technology Adoption,Inclusive Recruitment Strategies.

ISBN: 978-93-48505-24-8

A STUDY ON EVALUATING THE EFECTIVENESS OF BIAS TRAINING WITH REFERENCE TO FIRST STEPS BABY WEAR PVT., LTD., HOSUR.

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Abstract

There search is on the basis of "Organization, a leading firm in the technology sector. The study aims to evaluate the impact of bias training on employee attitudes, behaviors, and workplace inclusivity. A quasi-experimental research design was employed; comparing pre- and post-training outcomes among employees who participated in the training program. Data was collected through primary and secondary data with the total population of 1000 and sample size is 300 to capture qualitative insights. The sampling method used was stratified random sampling, ensuring representation across departments, genders, and hierarchical levels. Quantitative data was analyzed using paired t-tests to measure changes in employee attitudes and ANOVA to compare differences across demographic groups.

Qualitative data from focus groups was analyzed using systematic analysis to identify recurring patterns and themes related to training effectiveness. Key findings reveal that bias training significantly improved employee awareness of unconscious biases and fostered more inclusive behaviors. However, the long-term impact varied across demographic groups, with some employees reporting a need for ongoing reinforcement and practical application of training concepts. The study concludes that while bias training is effective in raising awareness, its long-term success depend on integrating it with broader diversity and inclusion initiatives. Recommendations include regular follow-up sessions, practical workshops, and leadership accountability measures to sustain behavioral change. This research provides valuable insights for organizations seeking to design and implement effective bias training programs to promote workplace inclusivity.

Keywords: Bias Training, Unconscious Bias, Diversity and Inclusion, Employee Awareness,

ISBN: 978-93-48505-24-8

A STUDY ON STATISTICAL ANALYSIS ON EMPLOYEE PERFORMANCE AND STRESS MANAGEMENT WITH REFERENCE FOR ROSHAN FRUITS INDIA Pvt Ltd

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Abstract

This study investigates the relationship between workplace stress and employee performance, analyzing how stress factors influence productivity and organizational outcomes. Using a quantitative, cross-sectional design, data is collected via validated scales Perceived Stress Scale, PSS and performance metrics KPIs, supervisor ratings. Data was collected through primary and secondary data with the total population of 1000 and sample size is 300 to capture qualitative insights. The sampling method used was stratified random sampling, ensuring representation across departments, genders, and hierarchical levels. Stratified random sampling ensures representation across industries, roles, and experience levels. Statistical analyses correlation, regression, and ANOVA assess stress-performance linkages while controlling for demographics. Recommendations include regular follow-up sessions, practical workshops, and leadership accountability measures to sustain behavioral change. This research provides valuable insights for organizations seeking to design and implement effective bias training programs to promote workplace inclusivity. Results aim to identify critical stressors and evaluate stress management interventions, offering evidence-based strategies for improving employee well-being and efficiency. The finding will aid HR policies and organizational psychology practices in fostering healthier work environments.

Keywords: Employee performance, occupational stress, stress management .sampling design, regression analysis, workplace product

ISBN: 978-93-48505-24-8

A STUDY OF EFFECTIVENESS OF HIRING PRACTICES INFLUENCE ON EMPLOYEE RETENTION AT KRISHNA TRANSNATIONAL MARBLES PVT. LTD

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Abstract

This study examines the effectiveness so hiring practices and there influency on employee retention at Krishna Transnational Marbles Pvt. Ltd. Using a structured questionnaire, data was collected from 100 respondents, including employees, HR managers, and recruiters, employing a stratified random sampling method. A 4-point Likert scale measured perceptions of hiring processes, employee satisfaction, and retention factors. Key findings reveal that 46% of respondents agree the hiring process is well-defined, 49% find compensation communication clear, and 46% see career growth opportunities, through only38%view job description as clear .Statistical analyses, including Pearson Correlation and Chi-Square tests, indicate a weak positive correlation between years of experience and job description clarity, feeling valued. The study highlights strengths in fairness and responsiveness but identifies gaps in job description clarity and on boarding. Recommendations include enhancing job descriptions, targeting younger talent, and improving gender diversity to boost retention.

Keywords: Employee Retention, Hiring Practices, Organizational Effectiveness.

ISBN: 978-93-48505-24-8

A STUDY ON EMPLOYEE RELATIONSHIP MANAGEMENT IN SHRI DEVARAJ GRANITE EXPORTING, KRISHNAGIRI.

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Abstract

The success of any organization largely depends on the quality of its employee relationships. **"A study on Employee Relationship Management in Shri Devaraj Granite Exporting, Krishnagiri"**—a leading player in the granite export industry. The objective of the study is to understand the effectiveness of existing ERM strategies, identify areas of improvement, and suggest measures to enhance employee satisfaction and productivity. Through a combination of primary data collected via structured questionnaires and interviews, and secondary data from company records, the study evaluates factors such as communication, trust, conflict resolution, and recognition. The findings indicate that while the company has established basic ERM practices, there is room for improvement in areas such as employee engagement, feedback systems, and grievance handling. The study concludes that strengthening ERM can significantly boost employee morale, reduce turnover, and contribute to the long-term growth of the company. Practical recommendations are provided to help the organization foster a more supportive and productive work environment.

Keywords: Employee Relationship Management, Employee Engagement, Human Resource Practices, Employee Satisfaction, Workplace Communication, Organizational Behavior, Employee Retention, Conflict Resolution.

ISBN: 978-93-48505-24-8

A STUDY ON ROLE OF HR ANALYTICS IN STRATEGIC DECISION MAKING WITH REFERENCE TO MAHA FURITS PRODUCTS PVT. LTD, KRISHNAGIRI.

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Abstract

The project report deals with the research topic **"A STUDY ON ROLE OF HR ANALYTICS IN STRATEGICS DECISION MAKING, KRISHNAGIRI".** Aim is to find out the level of commitment and morale of the employees. The main objectives are to study and understand the influence of the level of morale and commitment on the employees and to study how the employees are committed with the facilities provided in the company. For this project the primary data has been collected directly from the respondents using a questionnaire while the secondary data was collected from books, articles and websites. In convenience samplingtechnique. The sample size taken for the study is 120.

The population size is 180. The research design tool utilized in this study is descriptive analysis, using sampling method of probability method to serve as a robust method for interpreting survey data. Data has been studied and analyzed through statistical tools like correlation and chi-square test. Various insights have been found through the study and suggested to the management. Through descriptive statistics, including measure of central tendency and dispersion, the study seeks to summarize employee perception of fringe benefits and their impact on satisfaction and retention. By analyzing survey response quantitatively, the research aims to identify trends, patterns, and correlation that shed light on the effectiveness on fringe benefits in employee morale and organizational commitment.

Keywords: Employee commitment, morale, correlation, Chi-squire test, convenience sampling techniques.

ISBN: 978-93-48505-24-8

THE EFFECTIVENESS OF WORK-LIFE BALANCES PROGRAMS IN REDUCING EMPLOYEE STRESSES AT LUCAS–TVS LTD IN HOSUR.

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Abstract

The project report deals with the research topic **"THE EFFECTIVENESS OF WORK- LIFE BALANCE PROGRAMS IN REDUCING EMPLOYEE STRESS" at** LUCAS – TVS LTD IN HOSUR. This study investigates the effectiveness of work-life balance programs in reducing employee stress within organizations. With increasing workplace demands, stress among employees has become a significant concern affecting productivity, job satisfaction, and overall well-being. The research aims to evaluate how initiatives such as flexible work hours, remote work options, leave policies, and wellness programs contribute to stress reduction. Primary data was collected through structured questionnaires distributed to a sample of 250 employees across various sectors using a random sampling method. Secondary data was gathered from journals, websites, and previous research studies. The collected data was analyzed using descriptive statistical tools to interpret patterns and employee perceptions.

The findings suggest that effective work-life balance programs significantly lower stress levels, enhance employee satisfaction, and contribute to a healthier and more productive work environment. The study emphasizes the need for organizations to adopt employee-centered policies that support balance between professional and personal life.

Keywords: Work-life balance, Employee stress, Jobs atisfaction, Flexible work arrangements, Workplace well-being and Stress management.

ISBN: 978-93-48505-24-8

AN ANALYSIS OF HR EFFECTIVENESSOF TRAINING PROGRAMS ON EMPLOYEE PRODUCTIVITY WITH REFERENCE TO SUEIN AUTOMATIVE PVT LTD, HOSUR.

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Abstract

The project report deals with the research topic **"An Analysis of HR Effectiveness of Training Programs on Employee Productivity".** The aim of the study is to evaluate how HR training programs impact employee productivity, efficiency, and overall organizational performance. The objective is to assess the effectiveness of various training methods in enhancing employee skills, motivation, and job satisfaction. Primary data was collected directly from employees through a structured questionnaire, while secondary data was gathered from books, websites, and research articles. The study used a random sampling method with a sample size of 127 respondents. The quantitative tool utilized in this study is descriptive analysis, serving as a robust method for interpreting survey data.

Through descriptive statistics, including measures of central tendency and dispersion, the study seeks to summarize employee perceptions regarding training effectiveness, skill enhancement, and its impact on productivity. By analysis, the study identifies key trends, patterns, and the role of HR in designing and implementing effective training programs. In conclusion, HR training programs significantly enhance employee productivity by improving skills, job satisfaction, and engagement. Well-structured training initiatives lead to a more capable and motivated workforce. Organizations that invest in tailored training programs can see improved performance and higher employee retention. Overall, effective training is crucial for organizational success.

Keywords: HR training, Employee productivity, Employee development, Technical skills, Leadership development, Soft skills, Training effectiveness.

ISBN: 978-93-48505-24-8

A COMPARATIVE STUDY ON DIFFERENT SKILLS DEVELOPMENT FOR EMPLOYEES WITH REFERENCE TO CO-OPERATIVE SPINNING MILL LTD, UTHANGARAI.

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Abstract

The project report deals with the research topic "**A COMPARATIVE STUDY ON DIFFERENT SKILLS DEVELOPMENT FOR EMPLOYEES**." The aim of the study is to compare various skills development programs, including on-the-job training, classroom-based training, online courses, and mentoring, and assess their impact on employee performance, engagement, and productivity. The objective is to identify which training methods are most effective in enhancing employee skills and contributing to overall organizational success. Primary data was collected directly from employees through structured questionnaires, while secondary data was gathered from books, websites, and research articles. The study employed a random sampling method with a sample size of 110 respondents. The quantitative tool used in this study is descriptive analysis, a robust method for interpreting survey data. Through descriptive statistics, the study seeks to summarize employee perceptions of different training methods and their impact on job satisfaction, motivation, and skill enhancement. The analysis helps identify key trends in skills development and the overall impact of these programs. The findings emphasize that blended training methods, combining classroom, online, and on-the-job training, produce the highest improvements in employee performance and career advancement. This study concludes that no single training method is universally superior. However, a blended approach that combines various methods provides the most effective skills development for employees. The findings suggest that organizations should tailor their training programs based on individual employee needs and the specific skills required. A diverse, adaptable approach leads to higher employee engagement, improved performance, and greater career satisfaction.

Keywords: Employee skills development, Training programs, On-the-job training, Classroom training, Online courses, Mentoring, Employee performance, Career advancement.

ISBN: 978-93-48505-24-8

A STUDY ON IMPROVING THE CASH FLOW MANAGEMENT FOR SMALL MANUFACTURING UNITS

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Abstract

This study presents the cash flow management practices in small manufacturing units, with the goal of identifying common challenges and providing strategies to optimize cash flow. Analyzing the role of cash flow in the day-to-day operations of small manufacturers and explore effective practices that can improve cash flow management, ultimately contributing to business sustainability. It is crucial for the survival and growth of small manufacturing units, particularly in regions with fluctuating demand, seasonal production cycles, and limited access to capital. Efficient management of cash flow ensures that a business can meet its financial obligations, invest in new opportunities, and withstand periods of financial stress. However, many small manufacturers face challenges such as delayed receivables, high inventory costs, and inconsistent payment terms, which can adversely affect liquidity and operational stability.

The implementation of various strategies such as receivable managements, inventory managements, negotiating better terms with suppliers, cash flow monitoring, cash reductions and short-term financing options can help manufacturers ensure that they have sufficient liquidity to meet their operational needs, reduce financial stress, and avoid common pitfalls like late payments, delayed receivables, and poor inventory management and also provide practical solutions to optimize cash flow for these businesses. By focusing on these efficient strategies small manufacturers can ensure they have the necessary funds to sustain operations, grow, and seize new opportunities. Implementing these strategies can also help businesses reduce financial stress, avoid insolvency, and position themselves for long-term success.

Keywords: Cash Flow Management, Optimize Cash Flow, Business Sustainability, Fluctuating Demand, Financial Stress, Inventory Managements

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A STUDY ON EFFECTIVENESS OF DATA DRIVEN HR DECISION MAKING WITH REFENCE TO WEG INDUSTRIES PVT. LTD, HOSUR.

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Abstract

The project report deals with the research topic "**Effectiveness of data driven HR decision making".** The aim of the study is to understand how using data and analytics in related to recruitment, performance, employee engagement, and retention. The objective is to measure how data-driven approaches help HR become more strategic, accurate, and aligned with organizational goals. Primary data was collected directly from employees through a structured questionnaire, while secondary data was gathered from books, websites, and research articles. The study used a random sampling method with a sample size of 127 respondents. The quantitative tool utilized in this study is descriptive analysis, serving as a robust method for interpreting survey data. Through descriptive statistics, including measure of central tendency and dispersion, the study seeks to summarize employee perception of fringe benefits and their impact on satisfaction and retention.

By analysis, helping to summarize employee responses, and identify key trends, patterns, and the impact of data-based decisions in HR. The findings highlight how data-driven HR practices can lead to better decision-making, higher employee satisfaction, and improved organizational performance. The research confirms that data-driven HR decision-making significantly enhances strategic workforce planning, employee satisfaction, and retention. The ability to analyze trends and employee feedback using data allows HR professionals to make informed decisions, reducing biases and improving organizational outcomes. By adopting a data-centric approach, organizations can optimize HR functions, ensuring fairness, efficiency, and long-term growth.

Keywords: Data-driven decisions, employee engagement, performance, recruitment, retention, strategic HR, descriptive analysis, organizational growth.

ISBN: 978-93-48505-24-8

A STUDY ON EVALUATING THE IMPACT OF LIQUIDITY ON PROFITABILITY WITH REFERENCE TO TITAN COMPANY LIMITED, WATCH DIVISION HOSUR.

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Abstract

The project report deals with the research topic "A Study on Analysis of Liquidity on Profitability". The main aim is to understand the impact of a company's liquidity position on its profitability. For this project, primary data has been collected through financial statements and annual reports of selected firms, while secondary data was sourced from books, journals, and online databases. The study focuses on evaluating key liquidity ratios such as the current ratio, quick ratio, and cash ratio and comparing them with profitability indicators like net profit margin, return on assets, and return on equity. The analysis helps in understanding whether maintaining a strong liquidity position positively or negatively affects a firm's profitability. A descriptive research design is adopted for the study and statistical tools such as correlation and regression analysis are employed to determine the relationship between liquidity and profitability. The sample size considered includes data from multiple financial years of selected companies. The findings of the study are expected to provide insights for financial managers and stakeholders to make informed decisions regarding liquidity management and its influence on overall financial performance.

Keywords: Liquidity management, Profit maximization, financial health, working capital efficiency, earning efficiency.

ISBN: 978-93-48505-24-8

A STUDY ON EFFECT OF TRAINING ON EMPLOYEE'S PERFORMANCE TO WARDS GOOD CROP INDIA LLP WITH REFERENCE TO PALACODE.

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Abstract

The aim of the study is to assess **"The effect of training on employee's performance"** in palacode taking a case of GOOD CROP INDIA LLP. The Research report aimed at answering the specific objectives including the examined how skill development, knowledge enhancement and behavioral adjustments through various training positively influence employee's efficiency motivation and overall contribution to organizational success. The data were collected from both primary and secondary data. The primary data will be collected from the employees from the employee's observation, survey and interview method. Secondary data is collected from extracted journals, articles, websites, and company records. The total number of employees in the organization is 500. The studies have gone through questionnaires of 150 respondents under the research methodology used in Descriptive analyze.

The sampling method used was stratified random sampling, ensuring representation across departments, genders, and hierarchical levels. Quantitative data was analyzed using paired correlation to measure changes in employee attitudes and CHI-SQUARE TEST to compare differences across demographic groups. Research reveals that well-structured training programs lead to increased employee's confidence, Job satisfaction and reduced turnover rates. Furthermore training has been shown to directly correlate with improved problem solving abilities, Communication skills and adaptability in dynamic work environments. The finding of investing in employees training is essential for maintaining a competitive advantage and fostering a culture of continuous improvement leading to enhanced employee performance, skills, and engagement within the organization.

Keywords: Employee Training, Employee Performance, Job Satisfaction, Organizational Commitment, Productivity.

ISBN: 978-93-48505-24-8

A STUDY ON EMPLOYEE WELFARE MEASURES WITH REFERENCE TO GRANTELY PVT LTD, BANGALORE.

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Abstract

The project report deals with the research topic **"A STUDY ON EMPLOYEE WELFARE MEASURES" WITH REFERENCE TO GRANTELY PVT LTD, BANGALORE.** The term employee welfare measures encompass the various services, benefits, and facilities provided by the employers to improve the well-being of their employees. The main objective of the study is to analyze the effectiveness of the existing welfare measures. For this project the primary data has been collected directly from the respondents using a questionnaire while the secondary data was collected from books, articles and websites. Questionnaire was used to collect data from the sample and used random sampling technique.The sample size taken for the study 100 and the quantitative tool utilized in the study is descriptive analysis.. Research design is used descriptive analysis by using statistical tools, percentage, Chi square, correlation and also by ANOVAs.The organization's welfare measurees focus on **housing option, medical care, retirement benefits**,**and loan options.** This helps to inspire workers and to promote development of the employees. Labour welfare has the significance of creating conducive work environments that prioritize the well being and the rights of employees.

Keywords: Harmonious work environment, Employee Welfare, Retirement, Educational perks.

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A STUDY ON IMPACT OF AUTOMATION WORKFORCE DYNAMICS WITH REFERENCE TO DINESH ENGINEERING WORKS, HOSUR.

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Abstract

The project report deals with the research topic **"A STUDY ON IMPACT OF AUTOMATION AND WORKFORCE DYNAMICS TOWARDS THE DINESH ENGINEERING WORKS, HOSUR.** Aim is to find out the level of commitment and morale of the employees. The main objective is to study and understand the influence of the level of morale and commitment on the employees and to study how the employees are committed with the facilities provided in the company. For this project the primary data has been collected directly from the respondents using a questionnaire while the secondary data was collated from books, articles and websites. In convenience sampling technique. The sample size taken for the study is 120. The population size is 180.

The research design tool utilized in this study is descriptive analysis, using sampling method of probability method to serve as a robust method for interpreting survey data. Data has been studied and analyzed through statistical tools like correlation and chi-square test. Various insights have been found through the study and suggested to the management. Through descriptive statistics, including measure of central tendency and dispersion, the study seeks to summarize employee perception of fringe benefits and their impact on satisfaction and retention. By analyzing survey response quantitatively, the research aims to identify trends, patterns, and correlation that shed light on the effectiveness on fringe benefits in employee morale and organizational commitment.

Keywords: Employee commitment, morale, correlation, Chi- square test, convenience sampling techniques.

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A STUDY ON THE IMPACT OF TRAINING AND DEVELOPMENT ON EMPLOYEE SKILL ENHANCEMENT AND CAREER GROWTH WITH REFERENCE TO KML SENSOR PVT LTD, KRISHNAGIRI.

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Abstract

The aim of the study is to assess **"The Impact of Training and Development on Employee Skill Enhancement and Career Growth"** in Krishnagiri taking a case of KML SENSOR PVT LTD. As businesses strive to maintain competitive advantages in rapidly changing markets, investing in employees' skills has become increasingly important. This study explores the relationship between training and development initiatives and their influence on employees' professional growth, skill improvement, job satisfaction, and overall career progression. It examines various forms of training, including on-the-job Training, E-learning, and mentorship programs, to assess their effectiveness in enhancing employees' competencies. The data were collected from both primary and secondary data.

The primary data will be collected from the employees through observation, survey and interview method. Secondary data is collected from various journals, articles, websites, and company records. The total number of employees in the organization is 500. The studies have gone through questionnaires of 150 respondents under the research methodology used in Descriptive analyze. The sampling method used was stratified random sampling, ensuring representation across departments, genders, and hierarchical levels. Quantitative data was analyzed using paired correlation to measure changes in employee attitudes and ANOVA to compare differences across demographic groups. The findings suggest that structured training initiatives, including on-the-job training, e-learning, and mentorship programs,

Keywords: On-the-job Training, Mentorship programs, Skill improvement, Job satisfaction, Employee performance, Productivity and Retention.

ISBN: 978-93-48505-24-8

A STUDY ON ENHANCING THE EMPLOYEE PERFORMANCE THROUGH E-COMMERCE GROWTH ON TALENT ACQUISITION

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Abstract

This study explores the impact of employee performance on the growth of e-commerce businesses, with a particular focus on its influence on talent acquisition strategies. As the e-commerce sector continues to expand rapidly, driven by technological advancements and evolving consumer behaviors, organizations are increasingly recognizing the critical role of human capital in sustaining competitive advantage. Primary data was gathered through Employee with the total population is 500 and sample size is 150. Secondary data was collected from company records, books, magazine, performance reviews, and turnover rates. The data was analyzed using descriptive statistics to summarize employee perceptions and inferential statistics correlation analysis and regression analysis to identify relationships between talent acquisition practices and customer satisfaction, retention, and performance. High-performing employees contribute significantly to operational efficiency, customer satisfaction, and innovation key drivers of growth in the digital market place.

The research aims to analyze how employee performance metrics align with organizational growth objectives and how these, in turn, shape talent acquisition practices. It investigates the correlation between workforce productivity, quality of service, and the ability to attract and retain skilled talent in a competitive environment. The study includes a review of existing literature, along with primary data collected through surveys and interviews with HR professionals and e-commerce managers. Findings are expected to provide insights into best practices for integrating performance evaluation with recruitment strategies. This project contributes to a deeper understanding of how employee performance acts as a catalyst for talent acquisition and overall business success in the e-commerce domain.

Keywords: Consumer Behavior, E-Commerce, Customer Satisfaction.

ISBN: 978-93-48505-24-8

A STUDY ON ANALYSING THE ROLE OF ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE FUNCTION, KAIZENS AUTO PRODUCTS IN BANGLORE.

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Abstract

The project report deals with the research topic "A STUDY ON ANALYSING THE ROLE OF ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE FUNCTION, KAIZENS AUTO PRODUCTS IN BANGLORE. This study explores the growing impact of Artificial Intelligence (AI) on Human Resources (HR) functions, aiming to understand how AI is transforming traditional HR practices into more efficient, data-driven, and strategic operations. As organizations increasingly adopt AI to stay competitive, this research investigates its role in key HR areas such as recruitment, performance management, employee engagement, learning and development, and workforce planning.

To ensure data relevance and depth, the study targeted HR professionals working in mid-sized and large organizations. The population included HR managers, executives, and practitioners across various sectors. Using purposive sampling, a sample size of 100 HR professionals was selected based on their knowledge of or experience with AI tools in HR operations. Primary data was collected through structured questionnaires, while secondary data was sourced from academic journals, industry publications, and organizational reports. The findings indicate that AI tools—such as chat bots, predictive analytics, and machine learning algorithms—enhance efficiency in recruitment processes, improve performance evaluation accuracy, and facilitate real-time employee engagement tracking.

Keywords: Artificial Intelligence, Human Resources, Recruitment Automation, Predictive Analytics, Employee Engagement, Sampling Method, Purposive Sampling, HR Technology.

ISBN: 978-93-48505-24-8

A STUDY ON EMPHASIS ON EMPLOYEE ATTRITION IN THE WORKPLACE WITH REFFENCE TO TVS SPARE PARTS MANUFACTURING PVT LTD, BANGALORE.

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Abstract

The present study entitled "A STUDY ON EMPLOYEE **ATTRITION IN REFERENCE TO TVS SPARE PARTS MANUFACTURING PVT LTD, BANGALORE**. Employee attrition is a significant concern for organizations, as it can lead to productivity losses, increased recruitment costs, and a negative impact on company culture. This abstract explores the key strategies organizations can adopt to mitigate employee attrition and enhance employee retention. So the thing is company should take care of them in a friendly manner. Flexible working condition, supervisor relationship, career growth and development, management support, motivation these are all helps to reduce the attrition rate, why attrition occurs, and to find the areas where this company is lagging behind. The data was collected from both primary and secondary sources. The sampling method adopted by the researcher is Simple random sampling, and there search is Qualitative research and the descriptive tools such as Percentage analysis, chi-square test, correlation test and charts based on the interpretation certain valuable findings are given about the Employee Attrition . The company can also go for introducing new incentives schemes, transport facility, accommodation facility and to increase the bonus amount which helps the organization to motivate their employees to work even more and this brings best result from the employees.

Keywords: Attrition, Career growth, Career development, Motivation, Supervisor relationship, Management support.

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A STUDY ON THE IMPACT OF DIVERSITY, EQUITY, AND INCLUSION (DEI) PROGRAMS ON EMPLOYEE PERFORMANCE AND ORGANIZATIONAL CULTURE WITH REFERENCE TO SYNERGY INFOTECH PVT. LTD., BANGALORE

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Abstract

With reference to Synergy InfoTech PVT. Ltd. in Bangalore, the study's main topic is "A STUDYONTHE IMPACT OF DIVERSITY, EQUITY, AND INCLUSION (DEI) PROGRAMSONEMPLOYEEPERFORMANCEANDORGANIZATIONALCULTURE."Int hepresentbusinessenvironment,employeewell-being, productivity, and innovation. Reputable software and egalitarian culture. This study's main goal List on DEI programs affect job satisfaction, interpersonal connections, To further understand employee views and behavioral outcomes, the study used a mixed-method approach, combining quantitative and qualitative data. In order to guarantee representation from all departments, job functions, gender identities, and experience levels, a sample size of 350 individuals was chosen using stratified random sampling out of Synergy Infotech's 1200 total employees. Structured questionnaires, in-depth interviews, and corporate papers pertaining to DEI policies were used to gather data. To find patterns and connections between variables, quantitative analysis was carried out utilizing statistical methods such regression correlation analysis. In order to capture employee feelings and lived experiences surrounding workplace diversity, them analysis was used to evaluate qualitative data. The study's conclusions show Motivation levels. However, obstacles to long-term successes were found to include issues including unconscious bias, middle management's lack of understanding, and in adequate follow-up on DEI training. Continuous learning modules, leadership accountability, open grievance dressily procedures, and regular evaluation of DEI initiatives are all suggested by the study

Keywords: Diversity, Equity, Inclusion (DEI), Employee Performance, Organizational Culture, Workplace Bias, Inclusive Leadership, Employee Engagement

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A STUDY ON EMPLOYER AND EMPLOYEE RELATIONSHIP IN TOYOTA COMPANY, HOSUR

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Abstract

This study explores the dynamics of employer-employee relationships at Toyota Company in Hosur, aiming to understand how effective communication, trust, motivation, and management practices impact employee satisfaction and productivity. With the automotive industry being highly competitive and performance-driven, the relationship between employers and employees plays a crucial role in organizational success. The research focuses on Toyota's HR practices, grievance redressal mechanisms, and employee engagement initiatives. Data was collected through structured questionnaires and interviews with a cross-section of employees and managerial staff. The findings reveal that Toyota emphasizes mutual respect, open communication, and continuous improvement, which contribute positively to employee morale and organizational culture. However, areas such as work-life balance and upward communication still offer scope for enhancement. This study concludes by recommending strategies for further strengthening employer-employee bonds to sustain productivity and employee well-being. Population as per available data, Toyota Boshoku India Pvt. Ltd. in Hosur employs approximately 500 to 700 employees. This includes both permanent and contractual staff. Sample size is 100 to capture qualitative insights.

Keywords: Employee satisfaction, Employee relation, Employee benefits, Customer relationship, internal employee relationship management.

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A STUDY ON THE IMPACT OF WORKAHOLISM ON EMPLOYEE WELL-BEING IN HOSUR

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Abstract

The research is on the basis of "**The Impact of Workaholics On Employee Well-Being in Hosur"** Workaholics, characterized by an excessive and compulsive devotion to work, has become a pervasive phenomenon in modern workplaces. This study examines the impact of workaholics on employee well-being, exploring its effects on physical, emotional, and social health. A comprehensive review of existing literature reveals that workaholics are associated with increased stress, burnout, and decreased job satisfaction, ultimately compromising employee well-being. The findings suggest that organizations should prioritize employee well-being and implement strategies to prevent and mitigate workaholics, promoting a healthier work-life balance and reducing the risks associated with excessive work devotion.

Keywords: Workaholics, employee well-being, burnout, job satisfaction, work-life balance.

GREEN WASHING IN ECONOMICS, ECONOMETRICS, AND FINANCE: A BIBLIOMETRIC CARTOGRAPHY.

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Abstract

Green washing, the practice of misleading stakeholders regarding the environmental practices of an organization, poses significant challenges in the fields of economics, econometrics, and finance. This study aimed to provide a comprehensive overview of the current trends and future directions of green washing research by employing a bibliometric analysis. Utilizing data from Scopus databases, we systematically analyzed the literature to identify key themes, influential authors, leading journals, and major research institutions involved in green washing studies. Our findings highlight the evolution of green washing

research, reveal critical gaps, and suggest promising avenues for future research. This study not only contributes to the theoretical understanding of green washing but also offers practical insights for policymakers and practitioners striving to enhance transparency and accountability in environmental claims. By mapping the landscape of green washing research, we aim to foster a more informed and critical approach to combat deceptive environmental practices in the economic and financial sectors.

Keywords: Green washing, Economics, Econometrics, Finance, Bibliometrics, and Science Mapping

SIGNCALL: BRIDGING COMMUNICATION GAPS IN VIRTUAL MEETINGS WITH SIGN LANGUAGE RECOGNITION

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Abstract

Sign language is a visual mode of communication that uses hand gestures and movements to convey meaning, serving as an essential communication tool for individuals with hearing or speech impairments. Despite its importance, many virtual platforms lack the ability to recognize and interpret sign language, creating significant barriers to inclusivity in digital communication. As virtual meetings become more integral to professional and personal communication, the need for inclusivity in these spaces has grown. Current meeting platforms often fail to accommodate users who rely on sign language, limiting their ability to engage fully in discussions. The proposed system employs the Video Calling Vision Transformer (VCViT) to accurately recognize word-level hand gestures. The system captures live video streams from participants, focusing on hand gestures, and translates them into text or speech in real time. By utilizing advanced video processing techniques, gesture segmentation, and the VCViT's ability to model spatial relationships, the system achieves high recognition accuracy, adapting to different signing styles and environmental conditions. This project strives to create inclusive virtual meeting environments, allowing hearing-impaired individuals to actively participate in discussions.

Keywords: Sign language Recognition, Virtual meetings, Real-time translation.

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AI-ENHANCED CYBERSECURITY BY DETECTING AND MITIGATING ADVANCED THREATS IN REAL-TIME

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Abstract

The increasing adoption of Internet of Things (IoT) devices has significantly expanded the attack surface, posing severe cybersecurity challenges. Traditional intrusion detection mechanisms often struggle to adapt to sophisticated and evolving cyber threats, leading to higher false positive rates and reduced detection accuracy. To enhance network security, a deep learning-based network intrusion detection system is developed using a hybrid CNN-LSTM model. The system is trained on the NSL-KDD dataset to accurately classify different types of cyberattacks, including Denial-of-Service (DoS), Remote-to-Local (R2L), Probe, and User-to-Root (U2R) attacks. Convolutional Neural Networks (CNN) effectively capture spatial features from network traffic, while Long Short-Term Memory (LSTM) networks analyze temporal patterns to improve threat detection efficiency. Feature selection and preprocessing techniques, such as normalization and dimensionality reduction, optimize model performance and computational efficiency. A comparative evaluation with conventional CNN-based models highlights the improved accuracy and reduced false positive rates achieved by the hybrid approach. The system is deployed as a Flask-based web application, enabling real-time threat detection, intuitive visualization, and seamless network monitoring. The experimental results demonstrate the model's effectiveness in detecting malicious activities with high precision, ensuring enhanced protection for IoT and networked environments. This deep learning-driven solution offers a scalable and intelligent approach to mitigating modern cybersecurity threats.

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APPLYING NAIVE BAYES FOR HEART DISEASE PREDICTION AND RISK ANALYSIS

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Abstract

Data mining techniques have been widely used in clinical decision support systems for prediction or diagnosis of various diseases with accuracy. One important applications of data mining technique is to diagnose the heart diseases because it is one of the reasons for deaths over the world. Techniques involve one successful data mining technique named Naïve Bayesian algorithm.

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