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INTERNATIONAL CONFERENCE ON

INNOVATIVE RESEARCH IN ENGINEERING AND TECHNOLOGY

(ICIRET - 2025) (Hybrid Mode)

ESTD:1996

in association with ICTACADEMY

ICTACADEMY

28th MARCH 2025

Chief Editors

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Mannampandal, Mayiladuthurai District –609305

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Mannampandal, Mayiladuthurai District, Tamilnadu, India-609305

Justice K.VENKATARAMAN
Judge Administrator
A.V.C. Institutions & A.V. Charities

MESSAGE

Warm greetings to everyone! It is with great happiness to be a part of ICIRET-2025, a global platform focused on research, innovation, and technological advancement. In today's fast-paced world, it is crucial to encourage collaboration between academia and industry to drive meaningful discoveries and solutions.

ICIRET-2025 provides a unique opportunity for researchers, scholars and professionals to exchange knowledge, explore cutting-edge advancements and contribute to the future of Engineering and Technology. The diverse perspectives and expertise shared at this conference will undoubtedly lead to meaningful discussions and transformative ideas.

I extend my heartfelt appreciation to the organizing team, faculty members, and participants for their dedication and efforts in making this event a success. May this conference be a source of inspiration, collaboration and innovation for all.

Mannampandal
26.03.2025

[**Justice** K.VENKATARAMAN]

Dr. M. SENTHILMURUGAN, Ph.D.,
Director
A.V.C. College of Engineering

MESSAGE

I am delighted to extend my warm greetings to all the participants of ICIRET-2025, organized by A.V.C. College of Engineering. This International Conference reflects our institution's unwavering commitment for promoting innovation, research excellence and Industry-Academia collaboration.

ICIRET-2025 provides a unique platform for faculty, researchers and students to present their findings, engage in intellectual discussions and explore new frontiers in engineering and technology. The collaboration with ICT Academy further enhances the scope and impact of this prestigious event.

I appreciate the efforts of the organizing committee and encourage all participants to actively engage, share knowledge and contribute to shaping the future of technological advancements.

Mannampandal
26.03.2025

M. Senthilmurugan
[Dr. M. SENTHILMURUGAN]

Dr. P. BALASUBRAMANIAN, M.E., Ph.D.,
Principal
A.V.C. College of Engineering

MESSAGE

Research and innovation are the cornerstones of progress and ICIRET-2025 serves as a vital platform to drive these advancements. This international conference brings together academicians, researchers and industry professionals to explore emerging trends, innovative methodologies and real-world applications in engineering and technology.

By embracing a hybrid mode, ICIRET-2025 enables a broader and more inclusive participation, facilitating global knowledge exchange and diverse perspectives. The discussions and collaborations fostered here will contribute significantly for addressing technological challenges and shaping future solutions.

I extend my deepest appreciation to the conference organizers, faculty members and participants for their dedication and efforts in making this event a success. May this conference inspire meaningful research contributions and pave the way for groundbreaking innovations.

Mannampandal
26.03.2025

[Dr. P. BALASUBRAMANIAN]

Dr. S. SELVAMUTHUKUMARAN, Ph.D.,
Vice Principal
ICT Academy Co-ordinator
HoD, Department of Computer Applications
A.V.C. College of Engineering

MESSAGE

It is a proud moment for A.V.C. College of Engineering to host ICIRET-2025, a platform fostering research collaboration and technological advancements. This conference unites experts to explore emerging trends and innovative methodologies that shape the future of engineering.

The collaboration with ICT Academy further enhances the impact of this event, ensuring strong industry-academia linkages. Selected papers will be published in UGC Care Group - I ICTACT Journals, providing researchers a prestigious platform to share their findings. I commend the organizing team and wish all participants an engaging and insightful experience.

Mannampandal
26.03.2025

(Dr. S. SELVAMUTHUKUMARAN)

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ACKNOWLEDGMENT

We extend our heartfelt gratitude to all individuals and organizations who contributed to the success of **ICIRET-2025 – International Conference on Innovative Research in Engineering and Technology**.

Our sincere appreciation goes to:

- **Chief Patron, Patrons, and Conveners** – for their unwavering support and guidance in organizing this conference.
- **Keynote Speakers & Session Chairs** – for sharing their valuable insights and expertise, enriching the discussions on cutting-edge research and innovation.
- **Paper Reviewers & Technical Committee** – for their meticulous evaluation and constructive feedback, ensuring high-quality research contributions.
- **Authors & Participants** – for their enthusiastic engagement and knowledge-sharing, making this conference a platform for meaningful academic discourse.
- **ICT Academy & UGC Care Journals** – for facilitating the publication of selected research papers, thereby providing a prestigious platform for researchers.
- **Sponsors & Supporting Institutions** – for their generous contributions and collaboration in making this event possible, with special thanks to Marcello Tech for their sponsorship and support.
- **Organizing Committee & Volunteers** – for their dedication and relentless efforts in ensuring the smooth execution of the conference.
- Lastly, we extend our deepest gratitude to **A.V.C. College of Engineering** for providing an excellent academic and research environment that fosters innovation and collaboration.
- **Together, we continue to drive innovation and advance the frontiers of engineering and technology!**

Thank You....

ABOUT THE COLLEGE

A.V.C. College of Engineering, established in 1996, is a premier institution located on the main highway from Mayiladuthurai to Thirukkadaiyur in the scenic landscape of Mannampandal, Mayiladuthurai District, Tamil Nadu. The college is spread across 30.09 acres and is committed to providing quality technical education that meets global standards.

The institution offers eight undergraduate (UG) and two postgraduate (PG) programmes. It is affiliated with Anna University, Chennai, approved by AICTE, New Delhi and has received several prestigious accreditations:

- NBA Accreditation for the Computer Science and Engineering (CSE), Electronics and Communication Engineering (ECE), Electrical and Electronics Engineering (EEE) and Mechanical Engineering (MECH) programme.
- NAAC Accreditation with an *'A' Grade* (3rd Cycle), recognizing its commitment to academic excellence and holistic development.
- ISO 9001:2015 Certification, ensuring quality management and continuous improvement in education and research.

With a strong emphasis on industry collaboration, research innovation and student-centric learning, A.V.C. College of Engineering nurtures future-ready professionals equipped to address global challenges while contributing to societal progress. The institution continuously strives to bridge the gap between academia and industry, fostering a culture of innovation, entrepreneurship, and sustainable development.

ABOUT THE CONFERENCE

ICIRET-2025, the One-Day International Conference on Innovative Research in Engineering and Technology, is dedicated to fostering collaboration and knowledge exchange among faculty members, researchers, industry experts and students. This conference highlights cutting-edge advancements, explores emerging trends and showcases innovative methodologies and technological breakthroughs across various engineering domains.

Conducted in a hybrid mode, ICIRET-2025 offers the flexibility of both in-person and virtual participation, with a special emphasis on encouraging international delegates to participate virtually. This inclusive format ensures global collaboration, promotes the exchange of diverse perspectives, and contributes significantly to the advancement of engineering research and its societal impact.

The conference is organized in association with ICT Academy, enhancing its reach and impact through valuable industry-academia collaborations. Additionally, selected papers presented at the conference will be published in ICTACT Journals, providing authors with a prestigious platform to showcase their research contributions to the global academic community.

TECHNICAL SCOPE

ICIRET-2025 invites original research contributions and innovative solutions that address challenges and advancements in Engineering and Technology. The conference promotes sustainable development and interdisciplinary approaches bridging academia and industry. Contributions may include theoretical advancements, experimental research, simulations and case studies solving real-world problems.

Conference Tracks

Track 1: Artificial Intelligence & Machine Learning

- Large Language Models (LLMs) and Generative AI
- Deep Learning, Neural Networks & Explainable AI
- AI-driven automation in healthcare & industry

Track 2: Data Science & Edge Computing

- Advanced Analytics, Predictive Modeling & Big Data
- Edge Computing & Cloud Security
- Emotional Intelligence in AI

Track 3: Cybersecurity&Blockchain

- Cybersecurity challenges in IoT & Cloud
- Ethical Hacking, Cryptography & Risk Mitigation
- Blockchain for secure transactions & smart contracts

Track 4: IoT, Quantum Computing & Green Tech

- IoT for Smart Cities & Digital Twins
- Federated Learning & Privacy-Preserving AI
- Green IT, Quantum Computing & 5G advancements

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MESSAGING TOOL VIA SECURE AND END-TO-END CHANNEL

K. Sharath Kumar[1], Reddyvari Venkateswara Reddy[2], Yerra Srija[3], Mohammad Sohail Baig[3], Chinna Setty Srinu[3]
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Abstract- At a time when digital communication is at the heart of personal and professional relationships, it is crucially important to protect the security, and privacy, of personal digital communications. These abstracts describe the realization of a secure messaging application for protecting its users' communications confidentiality, integrity and availability. The tool is constructed to provide robust security including end-to-end encryption, secure storage and self-destruct messaging while at the same time being intuitive and platform-agnostic. The main goals of this work are to prevent any unauthorized access to the information by using cryptography techniques, to advise robust schemes for authentication of users, and to secure not only the information during transit but also at rest. The development process will address major challenges such as balancing security with usability, ensuring scalability for a growing user base, achieving interoperability across different devices and operating systems and compliance with various regulatory requirements.

Keywords– *secure messaging, data privacy, encrypted communication, confidential messaging, message security protocols, authentication, authorization, data integrity, secure-key management, privacy-preserving communication, transport layer security, secure storage*

IOT-ENABLED SMART RESPIRATORY HEALTH MONITORING: REAL-TIME DETECTION AND ANALYSIS

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Abstract- Asthma, pneumonia, and chronic obstructive pulmonary disease are respiratory conditions that have a major impact on world health and necessitate early detection and ongoing monitoring. Traditional respiratory health monitoring systems sometimes have limitations in terms of accessibility, real-time capability, and integration with modern healthcare frameworks. This paper presents a smart respiratory health monitoring system enabled by the Internet of Things (IoT) that employs wearable sensors, cloud computing, and machine learning algorithms to identify and assess respiratory issues in real time. The proposed system collects physiological data, such as heart rate, oxygen saturation (SpO_2), respiratory rate, and airflow patterns, using non-invasive sensors. These documents are securely transferred to a cloud-based platform, where advanced analytics spot irregularities and predict potential respiratory distress. To increase the precision of identifying the early signs of respiratory disorders, a machine learning model is trained on both historical and real-time data. The technique is successful in accurately identifying abnormal breathing patterns, according to experimental results. The suggested approach facilitates individualised health monitoring, lowers hospital visits, and increases access to remote healthcare. This study demonstrates how respiratory healthcare could undergo a radical transformation by becoming more proactive and patient-centred thanks to the Internet of Things (IoT) and artificial intelligence (AI). The proposed device continuously collects respiratory data, including oxygen levels and airflow, and transmits it to a cloud-based platform for study.

Keywords—*IoT, wearable sensors, cloud computing, machine learning, real-time detection, respiratory health monitoring, and intelligent healthcare.*

EMPATHETIC AI CHATBOTS: ADVANCING HUMAN-COMPUTER INTERACTION

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Abstract- Chatbots are becoming an essential part of human-computer interaction due to the development of artificial intelligence. However, the lack of emotional intelligence in typical chatbots limits their usefulness as personal assistants, mental health apps, and customer service representatives. The creation of emotionally aware chatbots, the technology that underpin them, and the difficulties in integrating emotion recognition into AI-driven conversational agents are all covered in this paper.

Keywords: *deep learning, sentiment analysis, natural language processing, human-computer interaction, and sympathetic AI chatbots*

AGENTIC EXPERIENCE: UNFOLDING LEARNINGS TO ADAPT TO NEW SITUATIONS

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[3]Student – Data Science & Applied Mathematics, Purdue University, West Lafayette, USA
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Abstract— Traditional RAG systems rely on retrieval-based architectures, where past conversations data is stored and accessed when needed. However, these approaches lack the ability to synthesize experiential knowledge, preventing AI agents from adapting and improving across interactions like humans do. This paper introduces Agent Experience (AX), a novel learning framework that enables AI agents to internalize problem-solving strategies, user behavior patterns, and contextual nuances rather than merely retrieving past responses. Unlike conventional memory-based systems, AX distills insights from previous interactions into a structured experiential knowledge base, allowing agents to apply past learnings dynamically to new situations. Inspired by human cognitive learning, AX enables an AI agent to categorize a problem, retrieve relevant experiential embeddings, select an optimal strategy, and refine its response based on feedback. Positive outcomes reinforce effective strategies, while negative feedback triggers adaptive reclassification and relearning. Our research highlights the transformative potential of AX, demonstrating how shifting from static memory retrieval to experience-driven learning allows AI agents to operate with greater efficiency, contextual awareness, and autonomy.

Keywords— *Agentic Experience (AX), Experiential Embeddings, Agentic Memory, Chain of Thoughts (CoT), Feedback loop.*

PREDICTIVE MODEL FOR THE ASSESSMENT OF TAXATION IN INDIA BASED ON SALARY VARIABLES UTILIZING MACHINE LEARNING ALGORITHMS

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Abstract- This manuscript delineates a thorough predictive framework designed to assess taxation in India, concentrating specifically on salary-related variables. The proposed methodology amalgamates both qualitative and quantitative strategies to formulate a precise model for tax forecasting. The framework incorporates advanced machine learning algorithms, including regression analysis and decision trees, to scrutinize the correlation between salary variables and tax obligations. Techniques for feature selection are employed to ascertain the most consequential factors impacting tax contributions, thereby ensuring the model's efficacy and precision. The predictive framework is further augmented by the integration of macroeconomic indicators and policy modifications, facilitating a dynamic estimation process that adjusts to shifting economic circumstances. The outcomes indicate a substantial level of accuracy in forecasting tax liabilities predicated on salary variables, offering invaluable insights for both policymakers and taxpayers. The findings emphasize the significance of employing advanced analytical methodologies to enhance tax estimation processes, thereby fostering transparency and efficiency within the taxation framework. This study not only aspires to improve the predictive accuracy of tax estimation but also endeavors to inform forthcoming policy decisions that can boost compliance and revenue generation within the Indian taxation framework.

Keywords—*Taxation, Machine Learning, Finance, Regression*

FUTURISTIC ROADWAYS DRIVING NEXT-LEVEL VEHICLE SPEED DETECTION USING OPENCV

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Abstract - This paper will present a project based on the application of the latest OpenCV and Python technologies for the development of an advanced vehicle speed detection system. The main aim of the project would be to design a real-time system capable of giving accurate vehicle speed detection and tracking from video sources. This system is particularly useful for traffic management, law enforcement, and enhancing road safety etc. The speed detection process for the vehicle begins with video input and later processes the input by the background techniques, that is, identifying moving vehicles from the static background in certain regions, to determine the speed of the vehicle. After detection, tracking of the vehicle is provided by algorithms like a Kalman Filter or a SORT algorithm. This project has significant applications in real-world scenarios. The traffic management authorities may use the system to study the traffic patterns and congestion, which would help in planning and infrastructure development.

Keywords- *YOLO, Real-Time Processing, Intelligent Transportation System, Computer Vision, Python, OpenCV, Multi-Object Tracking, Bounding Boxes, Pixel Mapping, Camera Calibration, Traffic Analysis, CNN*

A NOVEL FRAMEWORK FOR AUTOMATIC OBJECT DETECTION AND CLASSIFICATION OF BIO-DEGRADABLE AND NON-BIODEGRADABLE WASTE MATERIALS USING DEEP LEARNING

A Joshua Issac[1], G.Brindha[2], R. Vinodha[2], D. Sahana Sri[2], A. Agnes Mary Lavanya[2]
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Abstract- Effective waste management continues to be a major issue for contemporary urban areas, significantly affecting environmental sustainability and the general well-being of residents. In recent years, progress has been made through initiatives such as door-to-door waste segregation and collection. The digital transformation of the waste management sector is a gradual process that requires both time and efficient handling of waste segregation and collection. In this regard, advancements in hardware and software technologies, particularly those enabled by the Internet of Things (IoT), are playing a crucial role in accelerating this transformation. This project focuses on creating intelligent waste management system by integrating IoT communication protocols with AI-Powered deep learning for predictive analysis. The system aims to enhance efficiency by monitoring waste levels in real-time optimizing collection routes and predictive waste generation patterns, ultimately contributing a cleaner and more sustainable environment. Hardware sensors will continuously monitor bin status, while an image processing system will perform real-time object detection and classification. The AI-driven object detection model, pre-trained with images of various waste materials, will generate a frozen inference graph for accurate waste classification. This process will be carried out through a camera connected to a PC, serving as the primary processing unit. Additionally, each waste compartment will be embedded with intelligent sensors to track fill levels, ensuring timely waste collection. By integrating smart bins, a userfriendly application, and a robust visualization and decision-making platform, this system stands out as one of the most comprehensive and effective solutions in the field.

Keywords- *Waste Management System, AI, Deep Learning, IoT, Automated Object Detection, Smart Sensors and actuators*

APPLICATIONS OF GRAPH THEORY IN INFORMATION TECHNOLOGY AND COMPUTER SCIENCE

S.Mohan[1] , M. Durgadevi [2], Suruthi[2]
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Abstract- The area of mathematics plays an important role in many fields. One of the important areas in mathematics is graph theory which is applied in structural models. This structural arrangements of various objects or technologies lead to new inventions and modifications in the existing environment for enhancement in those field. This paper proposes some applications of graph theory in various fields, especially on the computer science and information technology.

Index Terms *– ad-hoc networks, face coloring, voronoi diagram*

HOME FRIENDLY IOT SYSTEM FOR MILK QUALITY ANALYSIS

Sangeetha S[1], Janani R[2], Katharin Precilda A[2], Sowmiya M[2]
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Abstract- Milk is an essential part of the human diet, providing vital nutrients, but its susceptibility to contamination and adulteration poses significant health risks. Traditional testing methods are time-consuming, require laboratory expertise, and are not easily accessible for everyday consumers. This project introduces a smart milk quality assessment system that enables real-time detection of spoilage, acidity changes, and adulteration using simple sensors. The collected data is transmitted to an online platform, where it is analyzed to provide instant feedback on milk safety. This system eliminates the need for complex laboratory tests, making it a practical solution for households, dairy farms, and small-scale vendors. Its cost-effective and user-friendly design ensures accessibility for both rural and urban populations. By offering an automated, reliable, and efficient way to monitor milk quality, this project enhances food safety, reduces health risks, and empowers consumers to make informed choices about milk consumption.

Keywords- *Milk Quality, Smart Monitoring, Food Safety, Real-Time Analysis, Consumer Awareness, Dairy Safety*

AI-DRIVEN LANDSLIDE PREDICTION AND AUTOMATED WARNING SYSTEM FOR ENHANCED PUBLIC SAFETY

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Abstract—Significant threats to people, property, and the environment are posed by landslides, especially in areas with unstable terrain and high rainfall. Communities are left vulnerable by the inaccuracy and tardiness of traditional forecast and warning systems. This research uses cutting-edge AI methods including Natural Language Processing (NLP), Convolutional Neural Networks (CNNs), and Logistic Regression (LR) to address these issues. To more accurately forecast possible landslides, the method combines historical data, satellite imagery, soil analysis, and weather information. CNNs examine visual cues and changes in the landscape, whereas LR models offers data that are easy to recognize and are helpful in determining how various factors affect the potential of landslides. NLP is used to create and distribute real-time warnings on social media sites like Facebook, Instagram, and Twitter, guaranteeing clear, localized information. Rapid notifications are guaranteed by the automated system, enabling communities to react.Through guide, efficient communication, this new approach improves public safety and prediction accuracy while reducing the effects of landslides and saving lives.

Keywords- *Landslides, Prediction, LR, CNNs, NLP, Satellite images, Real-time alerts, Risk assessment, publicsafety, Effective communication.*

REAL-TIME CLASSROOM ATTENDANCE SYSTEM UTILIZING RFID TECHNOLOGY

J.Sathishkumar[1], S.Asritha[2], K.Kiruthika[2], S.Sandhiya[2]
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Abstract— This RFID-based attendance system enhances efficiency, security, and data accuracy in educational institutions by automating attendance tracking with advanced features. It prevents duplicate scans in real-time, ensuring each student is marked accurately. A timer-controlled power-saving mode minimizes energy consumption during inactivity, reducing idle power usage by 40%. The system also monitors student departures, automatically marking absences if students leave without proper authorization, improving classroom oversight and security. Powered by a microcontroller and integrated with a centralized database, it ensures reliable data storage and management. A TFT display provides immediate feedback, displaying attendance status and alerts to users, improving interaction and reducing errors. With a 98% accuracy rate, the system delivers precise attendance records, promoting trust and reliability. Its intuitive interface enhances user experience, and seamless integration with school management software simplifies administrative tasks. The scalable design allows easy customization to meet the unique needs of various educational settings, ensuring long-term adaptability and efficiency.

Keywords— *RFID, Attendance Tracking, Duplicate Scan Prevention, Timer-Based Power Saving, Departure Monitoring, Real-Time Status Display, Classroom Oversight, Energy Efficiency.*

AN INTELLIGENT VEHICLE PRIORIZATION SYSTEM USING AI

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Abstract— The increasing traffic congestion in urban areas poses a significant challenge to emergency response times, often resulting in critical delays for ambulances and other emergency vehicles. This study proposes an intelligent system that utilizes the decision-making ability of artificial intelligence (AI) to prioritize emergency vehicles at traffic signals. Additionally, this system can be integrated into driverless autonomous vehicles so that they move out of the lane, clearing the way for the emergency vehicle to pass seamlessly. This version of the model incorporates advanced algorithms in deep learning, such as convolutional neural networks (CNN) and mel-frequency cepstral coefficients (MFCC). The convolutional neural network in this system processes CCTV footage collected from traffic signals, while the MFCC system simultaneously analyzes the audio spectrum collected via microphones. If an ambulance is detected by either system, the traffic signals are automatically adjusted to allow the ambulance to pass through, utilizing Internet of Things (IoT) communication. Considering various surveys on the response times of emergency vehicles and traffic congestion in metropolitan cities, this system would significantly reduce the death rate caused by delayed ambulances by efficiently prioritizing emergency vehicles at junctions and automatically adjusting traffic signals without any human intervention.

Keywords— *Emergency Vehicle, Traffic Congestion, Response Time , RFID , IR ,Sensors , Audio , Video, CNN , Deep Learning .*

END-TO-END DEEP CONVOLUTIONAL PRINTED ID FACIAL IMAGE STEGANOGRAPHY TO PREVENT FROM PHOTOGRAPH SUBSTITUTION ATTACK

D.Mahalakshmi[1], R.Umaira Parveen[2], G.Rindhiya[2], K.Kayalvizhi[2], S.Janani[2]
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Abstract - The term "character card" refers to a formal photo ID that, at least in Germany, can be used as an official identification document. Smart cards are commonly used for a variety of purposes, including government-issued retirement cards, electronic IDs, electronic markings, civil cards, key cards for restricted areas or organizational structures, and safe travel documents. These documents have numerous security elements intended to prevent counterfeiting. A system of verifiable IDs is essential for a healthy society. To reduce risks of fraud, government agencies and identity providers must constantly update and enhance their security processes. To overcome these issues, StegoCard presents an effective steganography technology targeted to the photographs usually found on government ID cards. A Deep Convolutional Auto-encoder creates a Stego representation that embeds a hidden message, while a Deep Convolutional Auto Decoder retrieves the encoded data. StegoCard works as a full-stack facial photo steganography model, with the Stego image serving as a message carrier. Notably, the technique stays efficient even when the image is printed and then digitized. Comparative analyses of Stego Stamp and StegoCard encoded facial photos show that StegoCard provides higher perceived quality. The model's performance is assessed using metrics such as signal-to-noise ratio, concealing capacity, and imperceptibility scores on the test set.

Keywords- *Convolutional Auto Encoder, Convolutional Auto Decoder steganography, StegoCard,*

ARITIFICIAL NEURAL NETWORK APPROACH IN DETECTING AND PREDICTING EPILEPTIC SEIZURE

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Abstract- Epilepsy is a chronic neurological condition characterized by recurrent, spontaneous seizures, often without a clearly identifiable cause. While factors such as brain damage and genetic predisposition can contribute, many cases remain unexplained. Accurately detecting and predicting seizures remains a significant challenge due to the vast variability in how epilepsy manifests among patients. Current methods often rely on in-hospital EEG monitoring with scalp or intracerebral electrodes, requiring extensive manual intervention and preprocessing. This research focuses on leveraging artificial neural networks (ANNs), particularly convolutional neural networks (CNNs) and recurrent neural networks (RNNs), to develop efficient, real-time seizure detection and prediction model. By analyzing EEG signals and extracting meaningful features, our system aims to provide timely and accurate seizure predictions, ultimately enabling proactive intervention and personalized treatment strategies. The study also explores the strengths and weaknesses of DL-based approaches, emphasizing their potential for improving diagnostic accuracy while overcoming challenges such as model generalization across diverse patient populations. The proposed system aspires to integrate seamlessly into clinical workflows, offering a reliable and scalable solution for epilepsy management through advanced deep learning techniques.

Keywords- *Artificial neural networks, Convolutional neural networks, Deep learning, Electroencephalography, Recurrent neural networks, Seizure detection*

AI-DRIVEN SIGN LANGUAGE DETECTION IN VIDEO CALLS USING DEEP LEARNING

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Abstract- Sign language is the primary mode of communication for millions of individuals with hearing or speech impairments. However, real-time sign language interpretation during video calls remains a significant challenge due to variations in gestures, lighting conditions, and computational constraints. This paper proposes an AI-driven sign language detection system that integrates computer vision, deep learning, and natural language processing (NLP) to recognize and translate sign language into text or speech in real time. The proposed model utilizes pose estimation, hand-tracking algorithms, and deep neural networks (DNNs) to improve accuracy and efficiency in video conferencing applications. The paper also explores the challenges of implementing real-time sign recognition and evaluates different AI models for improved performance.

Keywords- *Sign Language Recognition, Video Calls, Deep Learning, Computer Vision, Pose Estimation, NLP.*

AUTOMATED MULTIPLE SCLEROSIS DETECTION AND SEGMENTATION IN MRI USING DEEP LEARNING

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Abstract- The heterogeneity of Multiple Sclerosis (MS) is a challenge for the disease diagnosis and its evolution. In order to monitor the treatment and progression of MS, the segmentation and analysis of brain magnetic resonance imaging (MRI) lesions may offer quantitative evaluation metrics that may be used to compare images across various regions, patients, time points, and institutions. This study targets to provide a comprehensive review of brain MRI studies related to MS disease focusing on lesion segmentation, feature extraction, and Computer-Aided Diagnosis (CAD). Image segmentation methods were categorized regarding their supervision (i.e., supervised, and unsupervised), as well as their deep learning capability. Image analysis focused on feature extraction methods such as texture, structure, and image characterization. Furthermore, to address the challenges and future directions, enable better management of MS disease as well as offer personalized and precision medicine services in clinical praxis, an integrated CAD framework is proposed encompassing 3D reconstruction, registration and visualization, explainable artificial intelligence (AI) and assessment of disease evolution.

Keywords- *Brain MRI, classification, explainable AI, lesion, multiple sclerosis, segmentation, systematic review.*

LEVERAGING CONVOLUTIONAL NEURAL NETWORKS AND TRANSFER LEARNING FOR PLANT SPECIES RECOGNITION

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Abstract -Plant species classification is a crucial task in agriculture, environmental monitoring, and biodiversity conservation. This paper presents an advanced image recognition system for plant species identification using Convolutional Neural Networks (CNNs) and transfer learning. The proposed system incorporates a combination of data preprocessing techniques, robust feature extraction using CNNs, and classification utilizing pre-trained models such as VGG16 and ResNet50. The dataset comprises images from the Malaykew, Indian Leaf, and Swedish datasets, ensuring a comprehensive representation of diverse plant species. Experimental results demonstrate that the model achieves high accuracy, validating its effectiveness in plant species classification. Further optimizations, including extensive data augmentation, hyper parameter tuning, and real-time implementation, can enhance the model's performance for practical applications.

Keywords- *Convolutional Neural Networks, Transfer Learning, Plant Species Classification, Deep Learning, Image Processing.*

IMPROVING BREAST CANCER CLASSIFICATION THROUGH INTELLIGENT ADAPTIVE VOTING MODELS

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Abstract- Breast Cancer remains one of the leading causes of mortality among women, underscoring the need for accurate and efficient classification models for early diagnosis. Different methods are proposed for breast cancer detection. These methods mainly classify and categorize malignant and benign tumors. In this study, we propose an Adaptive Voting Ensemble Learning (AVEL) algorithm that integrates multiple machine learning classifiers to enhance breast cancer classification performance. The optimum classification for detecting breast cancer is ensemble-based. The ensemble framework combines the strengths of Extra Trees Classifier (ETC), Light Gradient Boosting Machine (LightGBM), Ridge Classifier (RC), Linear Discriminant Analysis (LDA), and Convolutional Neural Network (CNN) to improve predictive accuracy and robustness. Unlike traditional ensemble methods, AVEL dynamically assigns voting weights to individual classifiers based on their real-time performance, optimizing decision-making. Experimental results demonstrate that AVEL achieves superior classification accuracy, sensitivity, and specificity, outperforming standalone models and static ensemble techniques. The primary objective of this study is to determine the most effective ensemble machine learning classifier for breast cancer detection and diagnosis based on accuracy.

Keywords- *Breast Cancer, Extra Trees Classifier (ETC), Light Gradient Boosting Machine (LightGBM), Ridge Classifier (RC), Linear Discriminant Analysis (LDA), and Convolutional Neural Network (CNN), Voting Classifier.*

DEEP LEARNING-BASED DRIVER MONITORING AND DETECTION SYSTEM: A REAL-TIME APPROACH TO ENHANCING ROAD SAFETY

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Abstract— Synthetic errors in driving stem primarily from a combination of fatigue and drowsiness with mobile phone use eating drinking and other types of distraction which currently cause most road accidents globally. The proposed Deep Learning-Based Driver Monitoring and Detection System (DMDS) continuously evaluates continuously evaluates driver behavioral and physiological indicators in real time for early identification of fatigue and distraction symptoms. This system becomes essential for road safety because it reduces risks of impaired driver attention through automation for real-time alerts that trigger interventions. The DMDS employs state-of-the-art hardware such as computer vision technology deep learning approaches and physiological signal processing algorithms to accurately evaluate drivers accurately evaluate drivers. The system employs CNNs and RNNs to identify essential indicators including eye closure times and yawning quantities head movement directions and irregular steering activities. The system operates with external inputs consisting of vehicle data and environmental factors to enhance its distraction and fatigue identification capability. The deep learning architecture built in TensorFlow with the PyTorch platform utilizes pre-trained ResNet-50 among other models including MobileNet and LSTM to achieve better performance and minimize false detection. Throughout the detection of inattention events the system activates audio warnings visual alerts and haptic feedback through steering wheel vibrations to help drivers react quickly.

Keywords— *Driver Monitoring System Deep Learning Computer Vision Convolutional Neural Networks (CNNs) Intelligent Transportation Systems.*

BRIDGING TRADITION AND TECHNOLOGY: AN INTERACTIVE WEB PLATFORM FOR AYUSH

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Abstract- This paper presents an overview of the Virtual Herbal Garden, an interactive web-based platform designed to enhance awareness, education, and engagement with medicinal plants. The platform integrates an intuitive user interface, immersive visuals,and an extensive database to provide users with detailed insights into various herbs, their properties, uses, and cultivation techniques. The study explores the role of digital technology in promoting herbal knowledge, emphasizing the importance of accessible, interactive learning tools in preserving traditional and modern herbal practices. The proposed approach combines an AI-driven search system, interactive plant identification, and dynamic content delivery to create an engaging and informative user experience. Experimental results indicate that users find the platform highly effective in learning about medicinal plants, with increased retention and interest compared to conventional resources. The conclusions suggest that digital platforms like the Virtual Herbal Garden can play a significant role in bridging the gap between traditional herbal wisdom and modern technological advancements, making herbal education more accessible, engaging, and impactful for a wide audience.

Keywords- *Virtual herbal garden, medicinal plants database, Ayush informatics, interactive web platform, digital herbarium, plant classification.*

AI-POWERED DEAF COMPANION SYSTEM FOR INCLUSIVE COMMUNICATION BETWEEN DEAF AND HEARING INDIVIDUALS

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Abstract- Deaf individuals often face challenges in communicating with the hearing community, primarily because only a small portion of society understands or uses sign language. Although sign language and text-based communication are effective within the deaf community, they become limited when interacting with hearing individuals. This communication gap can result in feelings of isolation, frustration, and even discrimination for deaf individuals. To address this issue, the Deaf Companion System (DCS) is proposed, which facilitates two-way communication between deaf and hearing individuals using Indian Sign Language (ISL). The system leverages Temporal Convolutional Network (TCN), an advanced deep learning model, to improve the accuracy of recognizing and translating sign language.

SECURE VOTING SYSTEM USING SMART CARD AND IRIS RECOGNITION

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Abstract— In Bangladesh, elections face problems like people voting multiple times or casting illegal votes. To solve this, a new voting system is proposed that uses smartcards and iris recognition. Each voter will receive a smartcard containing their personal information, which helps confirm their identity before they vote. The system also uses iris scans, a very secure way to identify someone, ensuring that only the correct person can vote. This system prevents vote duplication and fraud. Although it may be costly and require some training, it aims to make elections more secure, fair, and honest by ensuring that each person votes only once.

Keywords— *Iris, Smartcard, Voting system.*

MACHINE LEARNING ENHANCED EMPLOYEE PERFORMANCE AND ATTRITION SUITE

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Abstract - In an era where organizations are continually seeking to enhance their operational efficiency and employee satisfaction, understanding and mitigating employee attrition has become increasingly critical. This paper presents a comprehensive study on the "Machine Learning Enhanced Employee Performance and Attrition Suite," aimed at predicting employee turnover and improving overall organizational performance.The primary objective of this research is to identify key factors contributing to employee attrition and provide actionable insights that enable proactive intervention strategies. By leveraging machine learning techniques, the study aims to enhance employee retention, job satisfaction, and productivity.Our approach involves the use of a combination of Random Forest Classifier and XGBoost Classifier models. To further refine the predictive accuracy, a meta-model using Logistic Regression is implemented, where the predictions of the primary models serve as input, yielding a single, cohesive prediction. This ensemble method not only improves prediction reliability but also offers deeper insights into the dynamics of employee turnover. Preliminary results indicate significant improvements in attrition prediction accuracy, facilitating timely and effective interventions. The implications of this study extend to broader organizational strategies, potentially transforming the ways in which human resource departments address employee attrition and performance management.

Keywords *- Employee Turnover, Machine Learning, Random Forest Classifier, XGBoost Classifier, Logistic Regression*

A SURVEY ON THE ROLE OF IoT IN AGRICULTURE FOR THE IMPLEMENTATION OF SMART FARMING

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Abstract- The Internet of Things (IoT) is transforming agriculture by enabling efficient and reliable solutions with minimal human involvement. IoTbased smart farming relies on key components such as sensors, actuators, connectivity, and data processing systems. Various network technologies, including different architectures, topologies like star, mesh, and tree, and protocols such as MQTT, CoAP, and LoRaWAN, facilitate seamless communication. IoT in agriculture integrates with cloud computing, big data analytics, and AI for improved decisionmaking and automation. However, security issues like cyber threats and data privacy concerns must be addressed. Several smartphone-based and sensor based applications have been developed for farm monitoring, soil analysis, and crop health tracking. Many countries are implementing regulations and policies to standardize IoT-based agriculture, but challenges such as scalability, interoperability, costs, and energy efficiency remain open research areas.

MEDICINE LABEL RECOGNITION FOR VISUALLY IMPAIRED PEOPLE

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Abstract- In today's world, medication adherence is a crucial factor in maintaining patient health and safety. However, for individuals with visual impairments, accessing essential drug-related information such as medicine names, dosage instructions, expiration dates, and side effects remains a major challenge. Traditional solutions like Braille labeling and caregiver assistance either lack comprehensive details or compromise personal independence. The absence of an accessible and efficient system for medicine identification increases the risk of medication errors, leading to potential health hazards. To address this issue, this research presents an AI-powered Medicine Label Recognition System, designed specifically to assist visually impaired individuals in accurately identifying and interpreting medicine labels. The system leverages deep learning and Optical Character Recognition (OCR) to extract text from medicine labels captured via a camera. The extracted information is then converted into audio output using Text-to-Speech (TTS) technology, allowing users to receive real-time medicine-related details audibly. Additionally, the system integrates Google API services to enable seamless scanning and recognition of medicine packages. A distinctive feature of this solution is its ability to translate medicine label details into Tamil is incorporated to support non-English-speaking users, further improving inclusivity. The user-friendly interface, equipped with voice guidance, ensures ease of navigation, empowering visually impaired individuals to manage their medications independently. Through advanced deep learning-based OCR models, intelligent data validation techniques, and real-time processing, the system significantly improves the accuracy and efficiency of medicine identification.

Keywords- *AI-powered, Deep Learning, Medicine Label Recognition, Optical Character Recognition, Text-to-Speech, Visually Impaired*

AN EFFICIENT BLOCKCHAIN-BASED FRAMEWORK FOR FILE SHARING

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Abstract- The widespread use of online social networks has resulted in a surge in photo sharing, but the vulnerability of photo privacy becomes apparent when these images are disseminated across multiple platforms. Current solutions often fall short in delivering efficient social network services without compromising user privacy. Introducing PhotoChain, a revolutionary blockchain-based framework designed to facilitate secure photo sharing across social networks. This framework incorporates advanced features, including dissemination control, face masking, photo integrity verification, access control, and dynamic privacy policy generation. Leveraging smart contracts, PhotoChain ensures a consistent consensus on dissemination control, while robust mechanisms for photo ownership identification are integrated to thwart illegal reprinting. A fully functional prototype has been implemented and rigorously tested, substantiating the framework's prowess in delivering security, efficacy, and efficiency for photo sharing across social networks.

Keywords- *Photo chain, Block-chain technology, PreHash Algorithm, Prototype of the framework, Locally simulated social network, Data sharing, Data retrieving, and data accessing.*

SMART DEDUPE CLOUD: STREAMLINING FILE STORAGE MANAGEMENT FOR OPTIMIZED EFFICIENCY

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Abstract- Although it is a noble objective, reducing storage redundancy in cloud storage systems by deduplication is not without its difficulties. The achievement of real-time deduplication to quickly detect and remove duplicate data as it is uploaded or altered is one major challenge. These days, having an efficient file management and storage system is crucial to avoiding wasting the storage capacity that cloud providers offer. Widely used data deduplication technique prevents file duplication on cloud storage servers by saving only one duplicate of a file. It can conserve bandwidth and storage capacity for cloud services, which can save cloud service users a lot of money. To maintain security, the data that must be stored is now encrypted. Therefore, cloud service users will not be able to deduplicate data if data owners encrypt it using their own keys. By identifying and storing redundant copies of the same content only once, the deduplication techniques used maximize storage capacity. The efficacy of the deduplication procedure is demonstrated by the fact that consumers can download the file with different filenames without double the storage requirements. This method preserves a single, deduplicated instance of the underlying material in the cloud-based storage system while permitting freedom in file naming, which not only improves storage usage but also simplifies the user experience.

Keywords- *Reducing storage, Deduplication, Encrypted data, Data security, Redundant content identification, Flexible file naming.*

ADVANCED MULTI -CLASS CANCER DIAGNOSIS LEVERAGING DEEP LEARNING TECHNIQUES

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Abstract— Cancer diagnosis using medical imaging has been significantly improved with the advent of deep learning techniques. This research presents a novel approach to multi-class cancer diagnosis by leveraging EfficientNet, a state-of-the-art convolutional neural network, combined with the median filtering algorithm for image preprocessing. The proposed methodology enhances classification accuracy and robustness by reducing noise in medical images and utilizing EfficientNet's efficient feature extraction capabilities. This study builds upon the foundation set by Malliga Subramanian et al. [1], who explored multi-class cancer classification using deep learning. Additionally, various works on multimodal learning [2][3] and spatio-temporal feature extraction [4] are reviewed to validate and extend our approach. Experimental results demonstrate improved performance over traditional CNN models, indicating the potential of this approach in clinical applications.

Keywords- *Cancer Diagnosis, Deep Learning, EfficientNet, Median Filtering, Medical Image Processing, Convolutional Neural Networks (CNN).*

SIGNEASE - REAL-TIME SPEECH-TO-SIGN LANGUAGE CONVERSION WITH 3D ANIMATED AVATARS

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Abstract- Effective communication remains a critical challenge for individuals with hearing and speech impairments, primarily due to the limited understanding of sign languages among the general public. This project presents an AI-driven real-time speech-to-Indian Sign Language (ISL) translation system, integrating speech recognition, natural language processing, and 3D avatar animation. By dynamically converting spoken words into ISL gestures, the system enhances accessibility in public events, government services, and educational spaces. Unlike conventional approaches, this solution ensures seamless, real-time interaction without reliance on human interpreters, fostering a more inclusive society. Its potential impact extends beyond accessibility, redefining human-computer interaction for assistive communication technologies.

Keywords- *Speech-to-Sign Language, Indian Sign Language (ISL), AI-Driven Translation, 3D Avatar Animation, Assistive Technology, Accessibility, NLP, Real-Time Communication, Hearing Impairment, Automatic Speech Recognition (ASR).*

HYBRID DEEP LEARNING CLASSIFIER:CNN-LSTM BASED INTRUSION DETECTION SYSTEM

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Abstract – Network Security is a crucial component of modern digital infrastructure, as the growing complexity of cyber threats poses significant risks to organizations. The real-time detection and mitigation of network intrusions require advanced methodologies beyond traditional rule-based approaches. This paper proposes a Hybrid Intrusion Detection System (HIDS) that integrates Convolutional Neural Networks (CNN) and Long Short-Term Memory (LSTM), networks to enhances the accuracy and efficiency of anomaly detection. The CNN component extracts spatial features from network traffic, while the LSTM captures temporal dependencies, ensuring robust detection of evolving attack patterns. This model is trained on a labeled network dataset, where preprocessing techniques are applied to extract relevant features and standardize input data. The hybrid CNN-LSTM model is evaluated using benchmark datasets, demonstrating high efficacy in detecting various attack types, including Denial-of-Service (DoS), probe, user-to-root (U2R), and remote-to-local (R2L) attacks. Experimental results indicate that the proposed HIDS achieves an exemplary detection rate, significantly reducing false positives while maintaining high precision, recall, and F1-score. On average, the system processes network traffic efficiently, making it suitable for real-time deployment in enterprise environments. The proposed HIDS framework strengthens cyber security defenses by providing an intelligent, adaptive, and scalable intrusion detection mechanism. Future enhancements will focus on integrating reinforcement learning for adaptive threat detection and extending the model to analyze encrypted traffic, further improving network security strategies.

Index Terms – *Cybersecurity, Intrusion Detection, CNN and LSTM Algorithm, Deep Learning and Network Security, Anomaly Detection*

COMPARATIVE ANALYSIS OF FEDERATED LEARNING METHODS FOR MULTI-CLASS SKIN LESION CLASSIFICATION

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Abstract- Federated Learning enables collaborative training of machine learning models across multiple clients while preserving privacy. However, performance drift due to labelskewed heterogeneity remains a critical challenge, affecting model convergence and performance in the case of medical applications because of population characteristics and diseases prevalent in the specific region. This study conducts a comparative analysis of FL methods FedAvg, FedProx, and MOON for skin lesion classification tasks under label-skewed data heterogeneity. We use the HAM10000 dataset for FLbased skin lesion classification, distributing data across 10 clients using Dirichlet partitioning. FedAvg, FedProx, and MOON are implemented with ResNet-18 locally and evaluated using multiple performance metrics. FedAvg achieves 74.56% accuracy through weighted averaging. FedProx, with a proximal term, stabilizes training but lags at 73.67%. MOON, using model contrastive learning, attains 75.16%, improving over time. MOON outperforms others in accuracy, precision, recall, F1-score, and Kappa score, demonstrating robustness against data heterogeneity. Our findings highlight the effectiveness of model contrastive learning in improving FL performance under data heterogeneity. Future work can explore hybrid FL strategies, apply MOON to larger medical datasets, and enhance personalization to improve classification performance across diverse healthcare institutions. This study provides insights into the performance of various FL methods for medical image classification while addressing key challenges in non-IID data settings.

Keywords *— Contrastive Learning, Federated Learning, Skin Lesion Classification, Medical Imaging*

EVALUATING THE EFFICACY OF CROSS-CATEGORY LARGE LANGUAGE MODELS IN COVID-19 LITERATURE QUESTION ANSWERING: A RETRIEVAL-AUGMENTED GENERATION FRAMEWORK LEVERAGING MULTIMODAL PDF DATA AND COMPREHENSIVE NLP METRICS

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Abstract - The COVID-19 pandemic required effective multimodal question-answering systems due to an unprecedented rise in scientific literature. This research examines four Large Language Models (LLMs) which include Multimodal and General-Purpose as well as Domain-Specific and Multilingual models when integrated with Retrieval-Augmented Generation (RAG) methodologies for COVID-19 literature Question-Answering (QA). A single RAG framework analyzes 42 peer-reviewed PDFs (with text along with tables and images) using FAISS indexing joined with OpenAI embeddings. The assessment of five domain-specific questions in epidemiology, virology and public health involved twelve NLP metrics which included Semantic Similarity, Factual Correctness as well as Context Precision/Recall, BLEU and ROUGE. Results from this research demonstrate two significant difficulties with QA systems that base their approach on either specialized or generalized techniques. A proposed system applies molecular-exclusive modeling techniques together with General-Purpose and Multilingual LLMs to develop a powerful solution. These findings provide direction for developing adjustable QA systems which unite domain knowledge systems with multi-lingual capabilities for future health emergencies.

SMART NEIGHBOURHOOD SERVICES: A REAL-TIME LOCATION-BASED PLATFORM FOR SECURE AND EFFICIENT SERVICE BOOKING

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Abstract - The design and deployment of a location-based service booking application are covered in this article. Through the application, customers can locate, schedule, and communicate in real time with nearby service providers. To deliver precise location-based recommendations, the system makes use of Next.js, Firestore, and the Google Maps API. Additionally, the program offers dynamic pricing, secure service provider verification, and real-time user-provider communication. Additionally, the application will provide a dashboard for service providers to monitor performance and premium services that users can sign up for to boost their service's visibility. While maintaining a high degree of dependability and consumer happiness, the system will increase the effectiveness of on-demand service booking.

Keywords- *Location-Based Services, Real-Time Booking Service Provider, Matching Firebase Dynamic Pricing.*

WORKSPACE MONITORING USING SENTIMENT ANALYSIS

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Abstract- In the digital era most of the work are repetitive on daily basis which starts to affect the emotional behaviour of the person and vice-versa. Monitoring the range of emotions that the employee is going through is very important to maintain/increase the workspace efficiency. Monitoring the employee's sentiment across time and taking them on corrective path is very crucial and must be done in real time to gain the maximum result. The proposed system monitors the employees on the working hours using the personalized Visual and Text assisted Emotional intelligent system. This system uses the XLNet [1]text analysis algorithm to gain the sentiment insights from the text. The system tracks down various events in the company which includes Regulations, Reorganization, Downsizing, Automation initiatives, flattening., and correlates it with the emotional changes amongst the employees. This correlation is done using the Time-lagged CrossCorrelation (TLCC) and the results are reported to the higher authority using the same platform. In order to work on the Sentiment drift problem, the system integrates schedule tracker which provides regular breaks by freezing the screen for a given span, Automatic mind refreshing pop-ups. The interconnected platform reports any behavioural changes to the higher authority in a hierarchical fashion with aging priority to indicate very serious problems to the correct officials. This strategy enables the work to continue in a steady and non-depleting manner. The system also integrates a System Aware Artificial Intelligence which acts as mentor and as a Personalized Assistant which keeps you on the track regardless of the emotional state fluctuations. The system is also visioned to work across multiple platforms for providing seamless workflow.

REAL-TIME IOT DASHBOARDS WITH AWS IOT CORE

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Abstract- This project focuses on creating real-time IOT dashboards leveraging AWS IOT Core for device management and data flow.The dashboard provides real-time visualization of IOT data, enabling users to monitor, analyze, and interact with connected devices .By integrating AWS services like IOT Device Shadow, IOT Analytics, and Amplify, this project delivers a scalable, interactive, and visually rich solution for managing IOT ecosystems. This paper explains how to build real-time IOT dashboards using AWS IOT Core, AWS IOT Analytics, and AWS Amplify. The system helps users monitor and analyze connected devices with live data visualization. Unlike traditional dashboards that struggle with real-time updates and cloud integration, this solution is interactive, scalable, and easy to use. The system uses - based communication, customizable widgets, and cloud-based data processing for better performance.

Keywords- *Internet of Things (IOT), AWS IOT Core, Real-Time Data, Visualization, Cloud Computing, IOT Analytics.*

PREDICTION OF CARDIOVASCULAR DISEASE WITH RETINAL IMAGES USING HYBRID APPROACH

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Abstract- Early detection of cardiovascular diseases (CVDs) plays a vital role in achieving better patient health results ecause they remain a significant worldwide health issue. Retinal imaging stands out as a popular non-invasive costefficient method to predict CVDs. The current models experience multiple difficulties which includes high computational requirements together with significant data needs and sensitivity to overfitting from smaller datasets. These systems face the difficulty of producing transparent results as well as image quality dependence and restrictions caused by sparse dataset variation. This paper proposes using MobileNet along with SVM to diagnose CVDs through retinal image analysis. MobileNet operates as the feature extractor because of its efficient architecture and supports SVM to process the extracted features. The developed model receives training through extensive retinal image datasets that contain images from healthy patients and patients with CVD. The model achieves successful results when predicting CVDs while providing a strong computational solution for early medical diagnosis and risk assessment. The proposed MobileNet-SVM model attains high accuracy, precision, recall and f1-score of 97.34%, 98.12%, 97.34%, and 94.2% during a training percentage (TP) of 90.

Keywords- *MobileNet, SVM, cardiovascular disease, retinal images, early detection, non-invasive diagnosis, healthcare.*

DETECTING FAKE PROFILES ON SOCIAL NETWORKS USING DEEP LEARNING

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Abstract- Fake profiles on social media platforms, such as Twitter, pose significant threats by facilitating the spread of misinformation, identity theft, cyberbullying, and online fraud. Traditional detection methods primarily focus on post-incident identification, relying on static training datasets and historical user activities. This paper proposes an innovative approach that integrates Natural Language Processing (NLP) with Bidirectional Encoder Representations from Transformers (BERT) for advanced text analysis and the Chaotic Sparrow Search Algorithm (CSSA) for optimized feature selection. BERT effectively captures nuanced linguistic patterns within user profiles, posts, and interactions, enhancing the detection of deceptive accounts. CSSA, an improved version of the Sparrow Search Algorithm (SSA), introduces chaotic maps to improve search efficiency, avoid local optima, and optimize feature selection, thereby refining classification performance. The combination of these methodologies enables proactive identification of fake profiles with higher accuracy and reduced computational complexity. Experimental validation using dynamic data demonstrates that our approach significantly outperforms traditional models, contributing to a more secure and trustworthy online environment.

Keywords: *Fake Profile Detection, NLP, Bidirectional Encoder Representations from Transformers (BERT), Machine Learning, Chaotic Sparrow Search Algorithm (CSSA) , SVM, Random Forest.*

A NOVEL SECURE DRONE ASSISTED HEALTH CARE SYSTEM BY USING MACHINE LEARNING ALGORITHM WITH BIG DATA FOR FUTURE GENERATIONS 6G WIRELESS NETWORKS

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Abstract - In this research, we propose a novel secure droneassisted healthcare system utilizing machine learning algorithms with big data for future 6G wireless networks. With the rapid advancement of Fifth Generation (5G) applications and the increasing demand for faster communication systems, we anticipate the emergence of Sixth Generation (6G) wireless networks around 2030. The use of drones in healthcare can significantly reduce costs by eliminating the need for expensive ground transportation to deliver medical supplies. Additionally, drones can enhance medical data collection and analysis, decreasing the reliance on costly human labor. This approach will also reduce the time and costs associated with medical treatments, as the data collected by drones can be quickly and efficiently analyzed. Our proposed healthcare system leverages machine learning algorithms with big data, integrated with future 6G networks. Simulation results demonstrate that this methodology outperforms existing methods, providing superior results.

Keywords-*6G Technology, Machine Learning algorithms, Big data, Healthcare. Drones*

EFFICIENT MONITORING OF DRESS CODE ADHERENCE USING AI AND LIVE CAMERA FEEDS

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Abstract - Maintaining a standardized dress code in Indian colleges is essential for discipline and uniformity. Traditional enforcement methods rely on manual supervision, which is time-consuming and error-prone. An Automated Student Dress Code Compliance System powered by Temporal Convolutional Networks (TCN) processes real-time surveillance footage to detect dress code violations. A dataset of annotated images, including male students in formal pants with tucked-in shirts and female students in chudhidars with shawls, is used to train the model. Upon detecting violations, the system alerts authorities via email or SMS for quick intervention. This approach reduces manual effort, improves accuracy, and ensures unbiased enforcement.

Keywords- *Dress Code Compliance, Temporal Convolutional Networks (TCN), Automated Surveillance, Real-time Detection, Machine Learning, Educational Institutions, Uniform Violation Detection.*

PRIVILEGE ESCALATION ATTACK DETECTION AND MITIGATION IN CLOUD USING MACHINE LEARNING

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Abstract - Because of the recent exponential rise in attack frequency and sophistication, the proliferation of smart things has created significant cybersecurity challenges. Even though the tremendous changes cloud computing has brought to the business world, its centralization makes it challenging to use distributed services like security systems. Valuable data breaches might occur due to the high volume of data that moves between businesses and cloud service suppliers, both accidental and malicious. The malicious insider becomes a crucial threat to the organization since they have more access and opportunity to produce significant damage. Unlike outsiders, insiders possess privileged and proper access to information and resources. In this work, a machine learning-based system for insider threat detection and classification is proposed and developed a systematic approach to identify various anomalous occurrences that may point to anomalies and security problems associated with privilege escalation. By combining many models, ensemble learning enhances machine learning outcomes and enables greater prediction performance. Multiple studies have been presented regarding detecting irregularities and vulnerabilities in network systems to find security flaws or threats involving privilege escalation. But these studies lack the proper identification of the attacks. This study proposes and evaluates ensembles of Machine learning (ML) techniques in this context. This paper implements machine learning algorithms for the classification of insider attacks. A customized dataset from multiple files of the CERT dataset is used. Four machine learning algorithms, i.e., Random Forest (RF), Adaboost, XGBoost, and LightGBM, are applied to that dataset and analyzed results. Overall, LightGBM performed best.. Among the proposed algorithms, the LightGBM algorithm provides the highest accuracy of 97%; the other accuracy values are RF at 86%, AdaBoost at 88%, and XGBoost at 88.

Keywords - *Insider Threat, Machine Learning, Cybersecurity, Ensemble Learning, Privilege Escalation, LightGBM, Random Forest (RF), Adaboost, XGBoost, CERT Database*

AI-POWERED DIGITAL SOLUTION FOR CIVIC ENGAGEMENT IN THE E-PETITION PROCESS USING NLP AND CNN

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Abstract— In this paper we are presenting a proposed system for AI-Powered Digital Solution for Civic Engagement in the e-Petition Process Using NLP and CNN algorithm.The system automates the classification and routing of both text and image-based petitions. Text-based petitions are processed using Natural Language Processing (NLP) techniques, while image-based petitions are classified using Convolutional Neural Networks (CNNs). This ensures faster and more accurate categorization, improving transparency and minimizing human intervention. By streamlining petition management, this solution enhances digital governance, increases citizen engagement, and makes the process more accessible, efficient, and reliable..

Keywords— *Natural Language Processing (NLP), Convolutional Neural Networks (CNNs), AI*

UNCERTAINITY-AWARE AND EXPLAINABLE MEDICAL SIGNAL PROCESSING USING BAYESIAN DEEP LEARNING

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Abstract- Accurate and interpretable diagnosis in medical signal processing is critical for effective patient care. Traditional deep learning models applied to medical signals, such as Electrocardiograms (ECG), offer impressive accuracy but lack uncertainty estimation and explainability, limiting their trustworthiness in clinical applications. This paper presents a novel approach that integrates Bayesian Deep Learning (BDL) for uncertainty quantification, combined with explainability techniques like SHAP (Shapley Additive Explanations) and Grad-CAM (Gradient-weighted Class Activation Mapping) to enhance model transparency. The proposed approach is validated using benchmark ECG dataset MIT-BIH Arrhythmia. By combining accurate classification, uncertainty quantification, and transparent decision support, this work contributes to the development of trustworthy AI for clinical environments.

Keywords- *ECG Signal Processing, Bayesian Deep Learning, Uncertainty Estimation, Explainability, Medical AI*

PREDICTING CREDIBILITY OF ONLINE REVIEW USING DEEP LEARNING

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Abstract: With the growing influence of online reviews on consumer decision-making, the rapid increase of fake reviews displays a significant challenge in maintaining credibility of digital marketplaces. Existing research primarily focuses on reviewer-based attributes or platform-specific filtering algorithms, which may not always be accessible due to privacy constraints. This study proposes a predictive model utilizing deep learning techniques to detect fake reviews based on review-centric attributes, eliminating the need for reviewer information. The model incorporates key textual and structural features such as review length, subjectivity, readability, extremity, and internal and external consistency.

END TO END DATA PIPELINE FOR HEALTHCARE RECOMMENDATION SYSTEM

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Abstract- Accurate and personalized treatment recommendations are essential for improving patient care. Traditional healthcare systems rely on generalized treatment plans, which may not be suitable for every individual. This project introduces an AI-driven Personalized Treatment Recommendation System that integrates hybrid recommendation algorithms (collaborative and content based filtering) with incremental learning to refine treatment suggestions based on patient history and feedback. The system also incorporates doctor validation and business intelligence (BI) tools to ensure reliability and transparency. The proposed approach is implemented using a structured end-to-end data pipeline, including data storage, ETL processing, AI model training, and performance monitoring. This solution enhances treatment accuracy, improves healthcare decision-making, and bridges the gap between AI automation and medical expertise.

Keywords- *Personalized Healthcare, AI Based Recommender System, Incremental Learning, Data Engineering Business Intelligence, Medical AI*

GENERATIVE AI FOR PERSONALIZED MEDICATION: AI-DRIVEN TREATMENT RECOMMENDA TIONS FOR STROKE PATIENTS

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Abstract- Stroke is a leading cause of disability and mortality worldwide, requiring early detection for effective treatment. Traditional methods rely on manual diagnosis, which is time consuming and prone to errors. This study proposes an AI-driven system integrating XGBoost for text-based patient record analysis and ShuffleNet for brain MRI image classification. XGBoost efficiently predicts stroke risk based on symptoms and medical history, while ShuffleNet classifies stroke types from MRI scans. The combined model enhances diagnostic accuracy while maintaining computational efficiency. The dataset consists of electronic health records and brain MRI images from stroke patients. The system undergoes rigorous preprocessing, feature extraction, and optimization for high performance. Experiments demonstrate 92% accuracy in text-based predictions and 94% accuracy in image classification. The proposed framework outperforms traditional methods in speed and precision. This study contributes to automated, AI-assisted stroke prediction for improved clinical decision making. This study proposes an AI-driven stroke detection system combining XGBoost for patient record analysis and ShuffleNet for MRI classification. XGBoost predicts stroke risk based on medical history, while ShuffleNet efficiently identifies stroke patterns in brain scans. The system enhances accuracy, speed, and clinical decision-making compared to traditional methods. This approach supports early diagnosis, better treatment, and improved patient outcomes.

DESIGN AND DEVELOPMENT OF A FOG ASSISTED ELEPHANT CORRIDOR OVER A RAILWAY TRACK FOR FUTURE SUSTAINABILITY

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Abstract-Rail accidents involving wildlife, particularly large animals such as elephants, represent a major threat to the preservation of animal and rail security. The system uses earthquake and ground vibration sensors to recognize patterns of animal movement and distinguish them from other environmental vibrations. By using algorithms for machine learning, the system classifies vibrations and triggers warning systems to notify railway authorities in real time. Compared to traditional recognition methods using cameras or infrared bases, this approach is inexpensive, with low visibility under conditions and reducing false alarms. The proposed system can be integrated into existing rail infrastructure to improve wildlife protection and rail safety. Future improvements include IoT-based connectivity and AI- controlled predictive analytics to improve accuracy and response capabilities. This innovative solution aims to minimize animal deaths and ensure smooth rail operations.

Keywords-*Machine learning, Vibration Sensor, railway Safety, IOT, Feature selection, Data processing*

AI- POWERED PERSONALIZED LEARNING: REVOLUTIONIZING EDUCATION WITH GENERATIVE INTELLIGENCE

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Abstract- Generative AI (GAI) technologies like ChatGPT are permanently changing academic education. Their integration opens up vast opportunities for bespoke learning and better student interaction but also brings about academic honesty issues and the application of real-life educators. This study aims to fill the literature gap regarding the use of multiple GAI tools and their effect on academic outcomes via a comprehensive review. A systematic literature review was performed following PRISMA guidelines to synthesize results on the potential and drawbacks of GAI in educational domains. We included theoretical and empirical papers that used qualitative, quantitative, or mixed-methods study designs. We have also explored conceptual frameworks and the most creative AI applications with a special emphasis on uniqueness and practicability. Experiences, and Perceptions Concerning To compile the information needed we gathered insights into what students were going through by conducting the survey which contains 200 respondents of undergraduate university students gathering insights into the college students' experiences and perceptions related to GAI used for educational purposes. At the basic level, GAI comprises areas like personalization, task automation, teacher assistance, and efficiency among others, and respective solutions for the immersion of a learner in learning processes to reform directions. However, it generates plenty of challenges such as the question of assessment integrity, the risk that too much automated grading could overwhelm educational value, and relevantly the veracity of AI-generated content as well as the potential disruption to skills like critical thinking. However, they also know the other side of the coin and are very familiar with the technology constraints and challenges.

Keywords- *AI in Education, Personalized Learning, Generative AI, EdTech Innovation, Adaptive Learning*

AN ENHANCED SENTIMENT ANALYSIS MODEL FOR INCORPORATING IMPLICIT ASPECTS

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Abstract- An aspect-based sentiment analysis method facilitates the examination of opinions concerning the features and attributes of products. Aspect sentiment analysis pertains to the emotions connected to specific aspects of a product. These aspects represent the characteristics or elements related to topics, products, and organizations. This paper focuses on the extraction of aspects along with corresponding customer sentiments. It presents a method for identifying consumer preferences regarding services through statistical opinion analysis. The proposed system retrieves both explicit and implicit aspects from customer reviews. Initially, it conducts pre-processing to eliminate irrelevant words from the review sentences. Following that, it carries out semantic aspect extraction and displays the review status. The system identifies implicit aspects by utilizing rule-based classifiers. In light of the increasing volume of unstructured reviews, the proposed system summarizes the information derived from these reviews, providing customers with clear and concise results.

Keywords- *Explicit –aspect ,Implicit – aspect, Rule Based Classifier*

A QR BASED AND VOICE ASSISTED NAVIGATION SYSTEM WITH REAL-TIME FACILITIES UPDATES FOR UNIVERSITIES

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Abstract - Navigating large university campuses can be challenging, especially for new students and visitors. Traditional GPSbased navigation systems are ineffective indoors, and existing solutions lack realtime facility updates and voice-guided assistance. To address these issues, we propose a Hybrid Campus Navigation System that integrates QR code-based indoor navigation, A algorithm for shortest route calculation, real-time facility updates using Firebase, and voice-guided assistance*. Users can scan QR codes placed at key locations to determine their position and receive step-by-step navigation instructions. The system leverages Google Maps API for outdoor navigation and A Pathfinding for indoor movement. Additionally, real-time status updates for facilities such as libraries and canteens enhance user experience. By combining modern web technologies (React.js, Flask, Firebase) with AI-driven pathfinding, our system offers an efficient, accessible, and scalable solution for seamless campus navigation.

Keywords- *Location-Based Services RealTime Booking Service Provider Matching Firebase Dynamic Pricing.*

HEART DISEASE PREDICTION USING MACHINE LEARNING ALGORITHMS

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Abstract— Heart disease is a leading cause of mortality worldwide, making early and accurate prediction crucial for timely intervention. Machine learning offers a powerful approach to predicting heart disease by analysing various health parameters. In this study, we compare the performance of classifiers such as Logistic Regression, Support Vector Machine (SVM), and Random Forest. Additionally, we propose an ensemble model that combines strong and weak classifiers using boosting techniques like AdaBoost and XGBoost to enhance predictive accuracy. By leveraging data mining techniques, our system processes large healthcare datasets to assist medical professionals in making more informed decisions. This approach aims to reduce diagnostic variability and improve patient outcomes by providing reliable, automated predictions. The experimental results demonstrate that ensemble models outperform individual classifiers in terms of accuracy and robustness. Our study highlights the potential of machine learning in enhancing clinical decision-making for heart disease diagnosis.

Keywords— *SVM, Random Forest, Logistic Regression, Adaboost, XG-boost, Python programming, confusion matrix, correlation matrix.*

SMART PETITIONS: AI-TOOL FOR PETITION TRACKING AND MANAGEMENT

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Abstract - The increasing use of digital platforms for activism has led to a surge in online petitions aimed at effecting social, political, and environmental change. However, managing and tracking the progress of these petitions, especially as they scale, remains a significant challenge. This paper presents SMART PETITIONS, an innovative AI-powered tool designed to streamline petition management, enhance tracking, and optimize engagement. SMART PETITIONS employs advanced Machine learning and Natural Language Processing to offer real-time analytics on petition trends, track progress, and analyze demographics. By incorporating social media insights, automated updates, and sentiment evaluation, the platform boosts visibility and engagement, helping petition organizers expand their influence effectively. Furthermore, the system's predictive capabilities offer insights into the petition's potential success, advising on the best strategies to boost support and influence decision-makers. Through its AI-driven features, SMART PETITIONS not only empowers petition creators but also fosters community collaboration, amplifying the voice of advocates worldwide. This paper explores the architecture, key functionalities, and potential impact of the platform, demonstrating how AI can revolutionize the petition process, making it more effective, transparent, and impactful.

Keywords- *AI-powered tool, petition management, petition tracking, machine learning, natural language processing, sentiment analysis, petition success prediction, real-time analytics, automated alerts, petition optimization, online petitions.*

IOT-BASED SMART LIQUID LEVEL MONITORING SYSTEM

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Abstract—The management of IV electrolyte containers is an essential but time-absorbing procedure for medical workers. Manual surveillance raises the rate of error and results in inefficiency, treatment delay, and undetected fluid loss that may lead to discomfort or significant medical complications [6], [9]. The process is also distracting away from critical medical procedures. To overcome such challenges, an IoT solution merges fluid sensors within electrolyte bottles, which are connected through GPS or Bluetooth technology [2], [5], allowing for real-time tracking. The sensors monitor fluid levels and automatically inform medical personnel if levels are running low, diminishing the need for manual checks and minimizing human mistakes. The system maximizes hospital resources by removing unnecessary IV checks, increasing efficiency, and facilitating prompt intervention through optimized IV management. By preventing complications from low electrolyte levels, the automated alert system also aids in a quicker response. The IoT-based system improves patient safety, reduces the chance of human error [1] associated with manual monitoring, and helps overworked healthcare professionals by allowing them to focus on essential duties. Patient care and hospital workflow may be significantly impacted by this technology. This paper examines the architecture, benefits, and difficulties of integrating IoT technology into IV electrolyte bottle management, emphasizing how it can revolutionize patient care and healthcare efficiency.

Keywords— *IoT (Internet of Things), Healthcare efficiency, IV fluid management, Real-time alerts.*

WINTHEJOB: AI-POWERED RECRUITMENT AND PLACEMENT PREPARATION PLATFORM

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Abstract—WinTheJob is an AI-driven recruitment and placement preparation platform designed to enhance job seekers' employability and streamline the hiring process for recruiters. The platform integrates advanced artificial intelligence and machine learning techniques to automate key recruitment tasks such as resume screening, skill-based candidate matching, virtual interviews, and AI-powered assessments. By reducing manual effort and hiring biases, it improves recruitment efficiency and ensures fair selection.For job seekers, WinTheJob provides a structured placement training program covering aptitude tests, coding challenges, soft skills development, and mock interviews, all tailored to individual progress. Gamified learning elements, real-time AI-driven feedback, and adaptive learning techniques help users identify strengths and areas for improvement. Additionally, recruiters benefit from AI-based job recommendations, automated candidate shortlisting, and predictive hiring analytics, making the selection process faster and more effective. By bridging the gap between job seekers and employers, WinTheJob fosters a smart hiring ecosystem that enhances career growth, upskills candidates, and optimizes recruitment workflows, making job placements more efficient and data-driven.

Keywords—*AI-powered recruitment, machine learning, automated resume screening, virtual interviews, placement preparation, aptitude training, gamified learning, AI-driven feedback, predictive hiring analytics, career development.*

INVESTIGATING EMOTIONAL INTELLIGENCE AND ITS IMPACT ON WORKPLACE INNOVATION-A REVIEW

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Abstract- Emotional intelligence (EI)—the capacity to recognize, understand, and manage one's own emotions and those of others—has been identified as a significant factor influencing innovation within the workplace. Employees with high EI are better equipped to navigate complex social interactions, manage stress, and adapt to change, all of which are crucial for fostering innovative behaviors . To gain a competitive edge over their rivals globally in this era of paradigm transition, corporate organizations should pay special attention to ensuring they have a creative and emotionally secure workforce. This calls for establishing an innovative corporate culture and focusing on an advancement approach. Numerous research show a strong correlation between innovative work behavior and emotional intelligence. Accordingly, the purpose of this study is to examine how emotional intelligence affects workers' creativity at work. Both parameters were examined independently during a thorough literature assessment of the aforementioned constructs.Additionally, the relationships between the two variables were examined using a variety of pertinent databases. Because the importance of emotional intelligence in allowing organizations to be more creative has not yet been thoroughly studied, people with emotional maturity are better able to modify their thought patterns to the chaotic demands of a constantly changing environment in order to survive and compete effectively in the current decades.

Keywords: *Emotional Intelligence, Innovation, Innovation at Workplace.*

DETECTING AI GENERATED PRODUCT REVIEWS USING LLM ALGORITHM

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Abstract- The detection of AI-generated product reviews is a complex task due to the increased use of large language models (LLMs) and their capability to generate convincing sentences. The AI-generated reviews can affect the consumers and businesses as they influence the trust and decision-making. This project investigates the differentiation between human-written and AI-generated texts through the analysis of linguistic features automatically extracted by an online computational tool. Utilizing a diverse set of phonological, morphological, syntactic, and lexical constituents, the research highlights significant variations between the two types of texts. This project is aimed at addressing the growing concern of AI-generated product reviews, specifically in both Dravidian languages such as Malayalam and Tamil, and English. As AI tools become more advanced, the ability to distinguish between human-written and AI-generated content has become increasingly crucial, especially in the domain of online reviews where authenticity is essential for consumer decision-making. The proposed model with LLM algorithm provides both document-level and sentence-level text detection through Instruction Tuning indicating that the model has good detection and classification ability for AI generated text.

Keywords- *ChatGPT,Product reviews app, linguistics, features, essays, automatic analysis*

DUAL - MODE BLOCKCHAIN BASED AUCTION SYSTEM FOR SECURE AND ANONYMOUS BIDDING

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Abstract - The design and secured platform for E-Auction system is covered in this article. Due to significant challenges faced in existing online auctions, including bidder identity exposure, bid manipulation, and lack of fraud prevention mechanisms. This paper proposes a Dual-Mode Blockchain Auction System that ensures secure and anonymous bidding using advanced cryptographic techniques. The system supports both Sealed Bidding and Open Bidding, integrating zk-SNARKs (Zero-Knowledge Succinct Non-Interactive Argument of Knowledge) for complete bid privacy in sealed auctions and Linkable Ring Signatures (LRS) for bidder anonymity in open auctions. A Commit-Reveal Scheme is also used to ensure fairness and transparency by preventing last-minute bid changes. To enhance security, a Bidder Reputation System is introduced to detect and prevent fraudulent activities. The entire auction process is managed through Ethereum-based smart contracts, ensuring decentralization and eliminating the need for intermediaries. The system also enhances accessibility and user experience by eliminating pre-deposit procedures. This approach significantly enhances bidder privacy, prevents fraudulent activities, and ensures a fair, transparent, and decentralized auction process.

Keywords: *Blockchain Auction, zk-SNARKs, Linkable Ring Signatures, Smart Contracts, Sealed Bidding, Open Bidding, Bidder Reputation System, Commit-Reveal Scheme, Privacy-Preserving Auctions*

IOT SMART AGRICULTURE MONITORING SYSTEM: A TECHNOLOGICAL ADVANCEMENT FOR PRECISION FARMING

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Abstract- The rapid evolution of the Internet of Things (IoT) has transformed industries across the board, including even agriculture. Smart Agriculture Monitoring System based on IoT aims to optimize agriculture efficiency through automation and tracking of multiple parameters such as soil moisture, temperature, humidity, and crop health in real-time. The present paper outlines an extensive research into design, development, and advantages of an IoT-enabled smart cultivation system. The system utilizes sensors along with a microcontroller that sends data to a cloud-based system to be determined and processed in real-time. The suggested solution minimizes wastage of resources and maximizes agricultural productivity, thus contributing towards sustainable agriculture.

Keywords: *IoT, Smart Agriculture, Precision Farming, Sensors, Real-Time Monitoring, Automation, Sustainable Farming*

POWERED EV SHARING AND CHARGING SYSTEM WITH CLOUD COMPUTING

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Abstract- There is a growing need for dependable and effective charging infrastructure as a result of the quick uptake of electric cars (EVs). However, finding available charging stations, scheduling charging times, and obtaining flexible battery exchange choices are frequently difficult tasks for EV customers, which causes delays and annoyance. The suggested system makes use of real-time data integration and sophisticated location-based services to give consumers precise information about the availability of charging stations and battery swap stations. It provides EV users with an easy-to-use mobile application that lets them look for charging stations and battery exchange locations in their area, browse station information, check slot availability, and make reservations ahead of time. Additionally, the system has a secure payment gateway that enables customers to reserve charging or battery exchange times and complete transactions with ease. Wait times are reduced and station utilization is maximized using an effective slot management algorithm. The suggested system greatly improves user convenience and helps create a more sustainable and orderly EV charging infrastructure by incorporating safe payment processing, battery exchange possibilities, and real-time notifications. The system architecture, implementation difficulties, and possible advantages for EV consumers and charging station operators are covered in this article.

Keywords- *Electric Vehicle (EV), Charging Station Locator, Mobile Application, Slot Booking System, Smart Charging Infrastructure, Location-based Services.*

SECURE TWO PATTERN AUTHENTICATION SCHEME

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Abstract — The issue of user authentication is a significant concern in the current computing landscape. As machines become more powerful, traditional authentication methods become weaker. This problem is particularly acute in the financial and banking sector, where online banking transactions are increasing day by day, necessitating robust authentication schemes. These systems are related to the fundamental asset of individuals or organizations, which is money, and any deficiencies in proper authentication can lead to significant losses. Currently, the most widely used authentication mechanism is the alphanumeric username/password combination. However, this traditional scheme is vulnerable to a wide range of attacks, such as shoulder surfing, phishing, man-in-the-middle attacks, and many more. Scheme proposed in this paper uses a dynamic approach for generating passwords, such as one-time passwords, to eliminate the static nature of secret credentials and also helps to reduce the burden of remembering long alphanumeric passwords.

Key words: *authentication, dynamic, shoulder surfing, phishing, man-in-the-middle attacks.*

OPTIMIZED MEDICAL SCHEDULING: PREDICTIVE MACHINE LEARNING AND DYNAMIC RESOURCE ALLOCATION

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Abstract- Efficient appointment scheduling plays a vital role in modern healthcare management. Traditional appointment systems often suffer from long waiting times, no-shows, and inefficient resource allocation. This paper presents a Smart Healthcare Appointment Portal that leverages real-time tracking, AI-based predictions, and dynamic scheduling to optimize patient management. The proposed system incorporates real-time patient status tracking, automated rescheduling, AI-driven no-show predictions, live teleconsultation integration, and smart check-in systems using QR codes and IoT. By utilizing Django Channels for Web Sockets, machine learning algorithms for predictive scheduling, and automated notifications via Twilio API, this portal enhances accessibility, reduces operational bottlenecks, and ensures seamless coordination between doctors and patients. The implementation of real-time updates ensures improved efficiency, better patient experience, and optimized resource utilization in healthcare facilities.

Keywords- *Healthcare Scheduling, Real-Time Tracking, AI-Based Predictions, Automated Rescheduling, Telemedicine, Smart Check-in, IoT Integration.*

ASPECT-LEVEL SENTIMENT ANALYSIS USING GRAPH NEURAL NETWORKS WITH DIVERSE INFORMATION SOURCES

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Abstract- Aspect-Based Sentiment Analysis (ABSA) aims to classify sentiment polarity towards specific aspects in a text. Traditional models struggle with long-distance dependencies and over-smoothing in deep learning architectures. To address this, we propose the Bidirectional Directed Acyclic Graph Neural Network (BDAGNN), which enhances syntactic representation using Bidirectional Directed Acyclic Graphs (BDAGs) and integrates SenticNet for affective knowledge. BDAGNN captures multi-hop sentiment propagation, improving sentiment classification accuracy. Evaluations on benchmark datasets (REST14, LAP14, REST15, REST16) demonstrate BDAGNN's superior performance over existing models.

Keywords- *Aspect-Based Sentiment Analysis, Graph Neural Networks, BDAGNN, SenticNet, Deep Learning*

WATER QUALITY PREDICTION USING MACHINE LEARNING

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Abstract— Since water is an important resource for sustaining human life, its quality must be preserved for the sake of human welfare. There are major health risks associated with the contaminated water, including diseases. such as diarrhea, cholera, and other watery diseases. Consequently, It becomes crucial to preserve safe and clean water in order to improve public health. 3,575,000 people are thought to die each year from illnesses linked to water, according to recent studies. Therefore, accurate forecasting of water quality could greatly reduce the incidence of these diseases. Machine learning algorithms have improved greatly in their ability to predict water quality, enabling precise and prompt water resource monitoring. We employed machine learning models in this research, such as the Random Forest Classifier, Support Vector Machine, Decision Tree, along with the K-Nearest Neighbor Classifier. The models are trained using a dataset that includes variables including conductivity, organic carbon, trihalomethanes, turbidity, pH, hardness, total dissolved solids, chloramines, sulfate, and trihalomethanes. The algorithms are assessed to accurately calculate the Water Quality Index using metrics like precision and recall. The Random Forest Classifier has the highest accuracy in predicting WQI for water quality classification when compared to other models.

Keywords— *Random Forest, KNN, SVM, Decision Tree, and Water Potability*

BLOCK CHAIN FOR SECURE AI MODEL TRAINING AND DISTRIBUTED AI MODEL

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Abstract- The integration of blockchain technology with artificial intelligence (AI) has emerged as a promising solution to address challenges in secure AI model training and distributed AI model deployment. This paper proposes an innovative framework that leverages blockchain for secure data sharing, model validation, and decentralized AI model distribution. The proposed system ensures data integrity, prevents unauthorized access, and enables collaborative AI model training across multiple stakeholders. Experimental results demonstrate the feasibility and efficiency of the framework in terms of computational overhead and security. This work highlights the potential of blockchain to revolutionize AI model training and deployment in distributed environments.

Keywords: *Blockchain, AI Model Training, Distributed AI, Data Security, Decentralization, Federated Learning.*

AI DISRUPTION IN HUMAN RESOURCE MANAGEMENT: TRANSFORMATIVE IMPACTS AND FUTURE CHALLENGES

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Abstract- The rapid advancement of Artificial Intelligence (AI) has led to significant disruptions across various sectors, with Human Resource Management (HRM) being no exception. AI technologies are revolutionizing traditional HR functions, enhancing efficiency, accuracy, and decision-making. From recruitment and talent acquisition to employee engagement and performance management, AI applications are transforming how HR professionals operate. AI-driven tools such as chatbots, predictive analytics, and machine learning algorithms help streamline the hiring process by assessing resumes, conducting initial interviews, and even predicting the potential success of candidates. In addition, AI's ability to analyze vast amounts of data empowers HR departments to make more informed decisions, leading to better workforce planning and management. Furthermore, AI's impact on employee engagement and retention is profound, as it enables personalized experiences and tailored development programs. By utilizing AI in employee surveys and feedback systems, HR departments can gather real-time insights, address issues proactively, and create a more dynamic work environment. However, as AI continues to reshape HRM, several challenges arise, including data privacy concerns, the ethical implications of AI decision-making, and the potential loss of human touch in managing people. The future of HRM will depend on balancing the benefits of AI integration with the need for human oversight and empathy. HR professionals will need to adapt to new technologies, develop new skill sets, and navigate a future where human and artificial intelligence work in tandem. While AI promises increased productivity and better workforce outcomes, addressing its challenges will be key to ensuring a positive impact on organizations and their employees.

Keywords- *Artificial Intelligence, HRM, Automation, Workforce Analytics, Employee Engagement, Ethical Concerns, Future Trends.*

AI-POWERED EVENT FEEDBACK SUMMARIZER: LEVERAGING GEMINI API AND GRADIO FOR ENHANCED FEEDBACK ANALYSIS

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Abstract- This paper presents an AI-powered Event Feedback Summarizer that leverages Google's Gemini API for natural language processing and Gradio for creating an accessible user interface. Event organizers frequently face challenges when analyzing large volumes of participant feedback, leading to inefficient decision-making and missed improvement opportunities. Our system addresses this challenge by automatically processing, categorizing, and summarizing event feedback, providing actionable insights through an intuitive interface. Experimental results demonstrate a 75% reduction in feedback analysis time while maintaining high accuracy in sentiment detection and key theme extraction compared to manual analysis. This work contributes to the growing field of applied AI for event management by providing an open-source, accessible tool that bridges sophisticated language models with practical user needs.

AI-POWERED CYBERSECURITY SYSTEM FOR SMART CITIES

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Abstract - With the rapid expansion of smart city technologies, securing urban infrastructures against evolving cyber threats has become crucial. This paper proposes an AI-powered cybersecurity system that leverages deep learning-based intrusion detection (IDS), blockchain-based authentication, and quantum-resistant encryption to enhance smart city security. The system utilizes CNN and LSTM models for real-time threat detection, Hyperledger Fabric for secure IoT device authentication, and lattice-based cryptography to counter future quantum attacks. Experimental results demonstrate 98.2% accuracy in threat detection, reduced false positives, and improved resilience against advanced cyberattacks. This research aims to provide a scalable, adaptive, and secure cybersecurity framework for next-generation smart cities.

keywords: *Smart Cities, Cybersecurity, Artificial Intelligence, Blockchain, Quantum-Resistant Encryption, Intrusion Detection, IoT Security.*

REAL TIME HAND GESTURE RECOGNITION FOR STROKE PATIENT MONITORING WITH PYTHON AND OPENCV

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Abstract- The aim of this paper is to assist stroke patient by their hand gestures. This paper is designed for the patients who are all struggling to communicate their needs. This paper helps them by sending email alerts to the caretakers when the predefined gesture is detected. A USB camera is used to capture the hand gestures of the stroke patient and python with OpenCV library is used for the image processing on a Raspberry Pi. The system involved in testing under various lighting situations at different spots. Analysis shows that proposed system has the benefits like accurate processing, recognition and fast email response. The patients can show their hand gesture and it will be recognized by the predefined gesture. When the patients perform the predefined hand gesture it will be recognized and the specific alert email will be sent to the caretakers. The developed system can be further improved to work better in low light conditions and support more gestures.

Keyword- *Hand gesture recognition, Stroke patients, OpenCV, Grabcut, Email alert*

AI AND PLAYTIME

How Intelligent Systems Can Reimagine Childhood Without Screens

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Abstract- With the rise of digital technology, excessive screen time has become a concern in child development. This paper explores how Artificial Intelligence (AI), specifically Generative AI, Machine Learning, and Emotionally Intelligent Systems, can create interactive, screen-free play environments. By integrating AI-driven interactive toys, emotion-responsive learning tools, and predictive analytics, we propose innovative methods for enhancing childhood play without reliance on screens. A study conducted in a high school ICT classroom tests the effectiveness of AI-powered play methods versus traditional digital interactions. Results indicate that AI-enabled physical play improves cognitive engagement, social interaction, and emotional intelligence. This research contributes to the field of AI in education by demonstrating how AI can be leveraged for immersive, screen-free learning experiences.

Index Terms—*Artificial intelligence (AI), AI education, Intelligent, digital learning, image classifier, machine learning (ML), school.*

SMART AGRICULTURE: LEVERAGING CONVOLUTIONAL NEURAL NETWORKS FOR PLANT DISEASE DETECTION.

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Abstract- In recent years, the application of artificial intelligence in agriculture has significantly advanced crop management practices, resulting in increased yields and reduced losses. This project focuses on the development of a robust system for the detection and classification of vegetable plant diseases using Convolutional Neural Networks (CNN) techniques. Traditional methods of disease identification are time-consuming and prone to human error, making them less efficient for large-scale farming. This study, employs CNN, a deep learning algorithm known for its proficiency in image recognition tasks, to analyze and classify images of vegetable plants exhibiting various disease symptoms. By utilizing CNN and EfficientNetB0 leverage pre-trained models to enhance the accuracy and speed of the classification process, even with limited labelled data. The proposed system is trained on a dataset of labeled images, and its performance is evaluated based on metrics such as accuracy, precision, recall, and F1 score. The results demonstrate the potential of the CNN approach to accurately identify a wide range of vegetable plant diseases, providing farmers with a reliable tool for early detection and timely intervention. This smart agriculture solution aims to empower farmers with actionable insights, leading to improved crop health and sustainable agricultural practices.

Index Terms- *Convolutional Neural Networks (CNN), Transfer Learning, Deep Learning, Plant Leaf Diseases, Image Processing, Smart agriculture, Accuracy, Precision, Recall.*

HARNESSING AI TO IDENTIFY AND COMBAT CYBERBULLYING IN ONLINE COMMUNITIES

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Abstract- Cyberbullying is a pervasive and destructive problem in modern online social media and communication platforms. It involves the use of digital technologies to intentionally and repeatedly harm or threaten others. Detecting and identifying cyberbullying behavior is crucial for mitigating its harmful effects and promoting safer online environments. This paper explores the application of machine learning techniques for detecting and identifying cyberbullying in social media. We discuss the key challenges, existing approaches, and novel methods for tackling this complex problem. The paper also examines the role of user behavior, network analysis, content analysis, and deep learning in cyberbullying detection. Finally, we highlight the importance of multi-modal approaches, ethical considerations, and future research directions in this emerging field.

DETECTION OF DEEPFAKE USING DEEP LEARNING TECHNIQUES & ALGORITHMS

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Abstract— The growth of deepfake technology poses acritical threat to information integrity. so it demands a strong and effective detection mechanisms. In this research we are implementing a multimodal approach and diamond cuts diamond (DCD) approach for deepfake detection across images audio and video by using deep learning algorithms and techniques. Specifically, we try to get the effectiveness of Convolutional Neural Networks (CNNs) 3D-CNNs and EfficientNet architectures for visual deepfake detection alongside Generative Adversarial Networks (GANs) and Wasserstein GANs (WGANs) to identify manipulation patterns. For audio deepfakes we employ Recurrent Neural Networks (RNNs) and Natural Language Processing (NLP)techniques focusing on identifying variance in speech patterns and acoustic features. We took a pretrained model that is available publicly and train that model with our own custom datasets along with publicly available datasets like DFDC and Forensics and augment training with a custom dataset of manipulated media. Furthermore, we analyze the efficiency and how much accuracy each approach can yield we are aiming to provide a comprehensive framework for reliable deepfake detection across diverse multimedia formats. This research contributes to the ongoing effort to combat the spread of manipulated content and safeguard digital trust

Keywords— *Deepfake detection , Multimedia forensics , Convolutional Neural Networks (CNNs) , 3D-CNNs , EfficientNet Custom dataset , Multimodal approach, Diamond cuts Diamond (DCD)*

PREDICTION OF BRAIN ALZHEIMER'S DISEASE FROM MRI SCANS USING DEEP LEARNING

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Abstract – Alzheimer's disease (AD) is a progressive and irreversible neurological disorder that primarily affects cognitive functions such as memory, decision-making, and behavior. Early detection of AD is crucial for effective intervention and disease management. Magnetic Resonance Imaging (MRI) has become a fundamental tool in the diagnosis of AD, enabling the identification of structural changes in the brain. Deep learning models, particularly ResNet, have demonstrated significant potential in medical imaging applications, including AD diagnosis. This study presents a ResNet-based deep learning model that analyzes MRI scans to predict the presence of Alzheimer's disease with high accuracy. The proposed model achieves a 92% prediction accuracy and includes single and bulk prediction capabilities, allowing for efficient processing of multiple MRI scans simultaneously. By leveraging advanced AI techniques, this research seeks to enhance early detection and facilitate timely medical intervention.

Index Terms – *Alzheimer's disease, Deep Learning, MRI, ResNet, Early Detection.*

MONITORING EMPLOYEE ENGAGEMENT BEHAVIOUR TO ENHANCE EMPLOYEE RELATIONSHIP WITH THE AID OF AI IN HOME APPLIANCE SHOWROOM, IRON AND STEEL INDUSTRY AND TEXTILE INDUSTRY

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Abstract- Employee engagement is a critical factor in organizational success, influencing productivity, retention, and overall workplace morale. With the advent of Artificial Intelligence (AI), organizations can now monitor and analyze employee engagement behavior more effectively, leading to improved employee relationships. This paper explores the application of AI in monitoring employee engagement across three diverse industries: home appliance showrooms, iron and steel, and textiles. By leveraging AI-driven tools such as sentiment analysis, predictive analytics, and real-time feedback systems, organizations can gain actionable insights into employee behavior, identify areas for improvement, and foster a more engaged workforce. The paper presents case studies from each industry, highlighting the challenges, AI solutions implemented, and the outcomes achieved. The findings suggest that AI can significantly enhance employee engagement and relationships, leading to better organizational performance.

Keywords- *(Employee Engagement, Artificial Intelligence, Home Appliance Industry, Manufacturing, HR Analytics, AI Monitoring)*

SUGARSMART: A DIABETES MANAGEMENT ASSISTANT

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Abstract—Diabetes mellitus is a prevalent chronic condition that requires continuous management to prevent complications such as cardiovascular disease, neuropathy, and kidney failure. Despite the importance of self-management, many patients struggle with adherence to complex regimens. In response to these challenges, mobile health technologies have emerged as effective tools to support diabetes care. This paper introduces SugarSmart, a mobile application designed to simplify diabetes self-management by integrating medication reminders, blood glucose tracking, and real-time communication with healthcare providers. A key feature of SugarSmart is its offline-capable reminder system, ensuring critical notifications are delivered even without internet connectivity. Furthermore, SugarSmart incorporates a High-Performance Computing dashboard that aggregates patient data and uses a Large Language Model to analyze trends and provide actionable insights. This AI-driven approach enhances decision-making by presenting healthcare professionals with easily interpretable narratives derived from complex datasets. By improving patient engagement, supporting self-management, and assisting clinicians in data interpretation, SugarSmart represents a significant advancement in the use of digital technologies for chronic disease management. This paper discusses the design, development, and potential impact of SugarSmart on diabetes care and its role in future innovations in mHealth and AI integration.

Keywords—*Diabetes mellitus, mobile health, diabetes management, medication reminders, blood glucose tracking, offline functionality, High-Performance Computing, Large Language Model, artificial intelligence, self-management, healthcare providers, chronic disease management, patient engagement, data analytics.*

FINANSMART - AI POWERED FINANCE MANAGER

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Abstract - Managing personal finances efficiently is a crucial aspect of financial well-being. Traditional methods of tracking expenses, such as manual data entry or reviewing bank statements, are time-consuming and prone to errors. To address these challenges, we propose FinanSmart, an AI-powered finance manager that automates transaction tracking and categorization using artificial intelligence.The system consists of two components: a mobile application (Android) and a web application. The Android app, developed using Java, automatically processes debit transactions by extracting details from SMS notifications received from banks. An AI model categorizes these transactions into predefined expense categories, providing users with a clear financial overview. Additionally, an AI-powered chatbot assistant enables users to query their financial data using natural language, offering insights into their spending patterns. Users can also analyze their expenses by date and month and export transaction details in Excel format for further review.The web application, built with Python and Streamlit, integrates with Google Sheets via API to offer seamless financial tracking. Users can manually enter transaction details through the AI chatbot, which stores the data in Google Sheets. The system then visualizes the transactions through interactive charts and graphs, enabling users to gain deeper financial insights.By leveraging AI-driven automation and intuitive financial visualization, FinanSmart enhances financial management by reducing manual effort and providing users with real-time spending analysis. This paper presents the system architecture, implementation details, and the impact of AI in streamlining personal finance tracking.

Keywords - *AI powered Finance Management -Automated Expense Tracking - SMS-based Transaction Processing - AI Chatbot Assistant - Financial Data Analysis - Google Sheets API Integration – Streamlit Web Application - Transaction Categorization – Personal Finance Automation-Data Visualization*

FITMENOW - A PERSONALIZED FASHION RECOMMENDER SYSTEM WITH VIRTUAL TRY-ON CAPABILITIES

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Abstract — Online fashion shopping has made it incredibly convenient for consumers to browse and purchase clothing from the comfort of their homes. However, the lack of a physical shopping experience often leads to uncertainty about fit, appearance, and overall satisfaction with the purchased items. This paper aims to revolutionize online fashion shopping by developing a personalized Fashion Recommender System - FitMeNow. Utilizing image processing and virtual try-on technology, the system will allow users to upload their own images and receive tailored clothing recommendations. Based on the user's body shape, style preferences, and uploaded image, the system will suggest the most suitable clothing items and visually demonstrate how they would look on the user. This innovative approach promises to significantly reduce return rates, enhance customer satisfaction, and foster greater confidence in online fashion purchases by providing a more interactive and personalized shopping experience.

Keywords *— Online fashion retail -Personalized recommendation system – Image processing – Customer satisfaction - Return rate - Body shape – Style preferences - Interactive shopping experience.*

RAILWAY POINT MACHINE STATUS MONITORING SYSTEM

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Abstract- The Railway Point Machine Status Monitoring System is designed to enhance the safety, efficiency, and reliability of railway operations by providing real-time monitoring of the status and health of railway point machines. These point machines are critical for controlling the direction of train tracks, ensuring trains follow the correct routes. This system utilizes a combination of sensors, embedded controllers, and wireless communication technologies to continuously monitor the operational status of point machines, including position, temperature, vibration, and electrical health. By collecting data from the point machines and transmitting it to a centralized control center, the system provides operators with up-to-date information on machine performance. It can also detect potential faults or deviations from normal operation, enabling preemptive maintenance and reducing the risk of failures that could cause delays or accidents. The system supports early warning alerts, predictive maintenance, and automated troubleshooting, thus optimizing the overall maintenance process.

A NOVEL STOCHASTIC MODEL FOR MEASURING THE CHANGES IN CORTISOL SECRETION LEVELS AND HEART RATE IN MORNING AND EVENING DUE TO PSYCHOLOGICAL STRESS IN HEALTHY HUMANS.

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Abstract—In this research article, we nominate a special kind of stochastic model which uses weibul markov distribution to model the changes in cortisol secretion during morning and evening due to psychological stress in healthy humans. The aim of this paper is to assess the effects of cortisol secretion and heart rate during the daytime which includes both morning and evening due to stress. The Trier Social Stress Test has been performed in both morning and evening and measured the cortisol secretion and heart rate for the considered subjects. Saliva cortisol secretion, heart rate responses have been observed before and after TSST in morning and evening using Weibull markov distribution. In addition, for the healthy humans, salivary cortisol response, heart rate responses before and after TSST in morning and evening using weighted exponential distribution is also measured. The obtained results shows that the proposed method using weibul markov distribution only clearly observing the changes in cortisol secretion levels and heart rate responses in morning and evening due to psychological stress in healthy humans when compared to weighted exponential distribution.

Keywords—*Cortisol secretion, Heart Rate, Trier Social Stress Test, weibul markov distribution, Weighted exponential distribution*

INTEGRATION OF OWNCLOUD SERVER FOR LOCAL DATA STORAGE IN A SMART WEATHER STATION

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Abstract-Real-time weather monitoring is essential for applications like agriculture, environmental research, smart cities, and disaster management. Traditional weather systems depend on third-party cloud services, which pose privacy concerns and require continuous internet access. This project presents a Smart Weather Station with real-time data capture, logging, and local storage using an OwnCloud server on a Raspberry Pi. The system integrates DHT22, BMP280, TSL2561, BH1750, and an anemometer to measure temperature, humidity, pressure, wind speed, wind direction, and light intensity. Data is processed using Arduino Uno and ESP8266, ensuring efficient acquisition and wireless transmission. The Raspberry Pi serves as the central storage unit, running an OwnCloud server for secure, self-hosted data management. Instead of using a complex web dashboard, data is stored in a tabular format for easy access, historical analysis, and manual review. Users can export records for further analysis, ensuring efficient monitoring without reliance on external cloud services. The local storage architecture ensures uninterrupted operation, even in low-connectivity areas. The system's modular design allows for future scalability, enabling integration with data visualization tools or IoT-based automation if needed. This low-cost, scalable, and efficient weather monitoring solution provides private, accurate, and easily accessible data, making it ideal for researchers, industries, and individuals. The integration of OwnCloud enhances privacy while maintaining structured real-time data accessibility.

SMART WEATHER STATION WITH REAL-TIME DATA CAPTURE AND LOGGING FEATURES

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Abstract- The Smart Weather Station project aims to develop environmental monitoring system that captures real-time weather data and logs it for future analysis. By integrating a variety of sensors including temperature, humidity, wind speed, atmosphere (barometric) pressure, and light intensity (lux) the station provides a comprehensive overview of local weather conditions. Real-time data is continuously captured and displayed on a local interface, while the logged data is stored in a cloud-based platform, allowing for easy access and long-term analysis. This weather station provides valuable insights into environmental changes, enabling users to track weather patterns, assess the impact of weather conditions on their environment, and make informed decisions based on real-time data. The paper focuses on the integration of multiple sensors with an emphasis on data accuracy, real-time processing, and accessibility. Additional features include automated alerts for extreme environmental conditions and the ability to view stored data through visual charts or a web interface, making it a versatile and intelligent solution for personal or educational.

ETHNOMEDICINAL LEAF IDENTIFICATION AND CLASSIFICATION USING DENSENET201

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Abstract – The identification of ethno medicinal plant leaves is crucial as traditional medicinal knowledge is gradually fading. Many existing models, such as VGG16, VGG19, and ResNet50, struggle with accurately classifying plant species due to their inability to capture subtle features like vein patterns and edge details. To address these limitations, our proposed system leverages the DenseNet201 model, which provides enhanced feature extraction and deep connectivity, ensuring improved classification accuracy. This system aims to prevent mis identification and provide reliable medicinal information about plants, including their properties, uses, and benefits. A structured database is integrated to systematically record ethno medicinal knowledge, preserving valuable traditional healing practices. By linking classified plant species to verified medicinal data, this system ensures accessibility and accuracy in ethno medicinal research. The integration of advanced deep learning models with indigenous knowledge contributes to both the conservation and dissemination of traditional medicine. This project serves as a bridge between AIbased classification and traditional healing practices, promoting the accurate identification of medicinal plants while preserving valuable cultural heritage.

Index Terms *– Ethno medicine, Medicinal plant classification, Deep Learning, DenseNet201.*

A NOVEL FRAMEWORK FOR ALZHEIMER'S DISEASE STAGE PREDICTION USING MACHINE LEARNING AND MULTI-AGENT TECHNOLOGIES

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Abstract- As life expectancy continues to rise in modern society, the prevalence of age-related diseases has also increased. Alzheimer's disease (AD), a common form of dementia that primarily affects older adults, is one such condition. AD is a progressive and irreversible brain disorder that gradually impairs memory, thinking, reasoning, and other cognitive abilities. The likelihood of developing Alzheimer's rises significantly after the age of 65, with the disease's severity worsening over time. Early warning signs of AD include poor judgment, emotional changes, difficulty completing familiar tasks, misplacing items, trouble solving problems, and challenges with learning new things. Key risk factors for AD include smoking, hypertension, diabetes, obesity, and advancing age. In recent years, the number of AD patients has increased dramatically, particularly in developed countries with longer life expectancies. Machine learning and agent systems have made tremendous strides in various fields, including weather forecasting, robotics, search engines, natural language processing, speech recognition, medical diagnosis, and handwriting recognition. Machine learning, a fundamental component of Artificial Intelligence (AI), is an evolving technology that enables computers to "learn" by developing classifiers. This technology aims to address problems related to inference and prediction using available data, which is essential for decision-making by humans or intelligent systems like agent systems. An agent system refers to a computer system placed in an environment that can perform flexible, autonomous actions to achieve its design goals.

AN ENHANCED AI-DRIVEN EPIGENETIC BRAIN REPROGRAMMING FOR PERSONALIZED MENTAL HEALTH TREATMENT

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Abstract- The convergence of artificial intelligence (AI) and epigenetic engineering presents a transformative opportunity to address complex neurological and psychiatric disorders, including Alzheimer's disease, schizophrenia, depression, and anxiety. Current therapeutic strategies for these conditions often lack precision, efficacy, and personalization, underscoring the need for innovative approaches. This work proposes an enhanced AI-driven epigenetic brain reprogramming framework designed to dynamically modulate gene expression networks, neural plasticity, and disease specific pathways through targeted epigenetic editing. By integrating multiomics data (e.g., DNA methylation, histone modification, non-coding RNA profiles) with clinical, neuroimaging, and real-time biometric inputs, the AI system employs deep learning algorithms to predict optimal epigenetic targets and design patient specific intervention strategies. Clinical translation aims to mitigate trial and-error prescribing, reduce side effects, and address comorbidities through precision epigenome engineering. Challenges include ethical considerations of epigenetic manipulation, scalability, and validation of long-term safety. This paradigm shift toward AI-augmented epigenetic reprogramming holds promise for revolutionizing mental health care, offering scalable, individualized therapies that target the root mechanisms of diverse brain disorders.

Keywords: *AI, Epigenetics, Neurological Disorders, Psychiatric Disorders, Alzheimer's, Schizophrenia, Depression, Gene Expression, DNA Methylation, Multi-Omics, Deep Learning, Precision Medicine, Neuroimaging, Personalized Therapy..*

AI-BASED RECONSTRUCTION: FROM HANDWRITTEN AND DRAWINGS TO REALISTIC IMAGES

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Abstract – AI-powered system that converts simple hand-drawn sketches and handwritten text into realistic images while ensuring the correct positioning of the text in relation to the generated object. The system first detects and classifies the drawing using a Convolutional Neural Network (CNN), extracts handwritten annotations, and generates a descriptive prompt. This prompt is then fed into an DALL-E 2., which generates a photorealistic version of the sketch. Finally, the handwritten text is re-integrated into the generated image at its original location, preserving both meaning and spatial relationships. The system is integrated into a user friendly interface built with Streamlit, allowing users to upload their sketches, view the generated prompts, and visualize the corresponding images in real time. This seamless workflow enables the transformation of simple drawings into detailed visuals, with applications in creative design, education, and digital art.

Keywords- *Handwritten Sketch, Text-toPrompt, Convolutional Neural Network (CNN), Image Generation, DALL-E2, Streamlit, Gradio, Github*

STROKE DETECTION HAND BAND USING EMG SENSOR

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Abstract— Stroke counts as a leading reason for disability and decease all over the world and it usually involves immediate medical responses. This study aims at showing a wearable stroke detection system, which is likely to be a hand band with medical sensors. The system is interfaced with the main controller (ESP8266), the stroke detection sensor (EMG), and the real-time communication module (SIM800L GSM). The collected data is processed in order to allow an early signal detection, which shall automatically alert the operators in the form of a mobile call to the caregivers or emergency services when a particular signal is detected. This IoT-based platform presents a technological, cost-benefit, and successful solution towards the early detection of stroke to improve treatment and response protocol.

Keywords— *EMG – Electromyography ,ESP8266 – Espressif Systems Processor 8266,SIM800L GSM - SIMCom 800L Global System for Mobile Communications Module*

DETECTING AND CLASSIFYING MULTIPLE EYE DISEASES USING A DEEP ENSEMBLE MODEL

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Abstract - Advancements in technology have made it possible to create automated systems that can detect diseases early, saving time and allowing for quicker treatment, which helps maintain good health. Many people in developing countries lose their eyesight at a young age due to eye diseases. Detecting these diseases early is crucial to prevent permanent vision loss. Today, artificial intelligence (AI) can automatically identify serious eye diseases. Diabetes is a major cause of several eye conditions, including diabetic retinopathy, diabetic macular edema, cataracts, and glaucoma. This study focuses on automatically detecting three eye diseases: Choroidal neovascularization, Diabetic macular edema, and Drusen. The proposed system uses a combination of three AI models—VGG16, Xception, and MobileNet—to extract important features from eye scans. These features are then analyzed using a convolutional neural network (CNN) to classify images into one of four categories: Choroidal neovascularization, Diabetic macular edema, Drusen, or Normal. The effectiveness of this model is evaluated based on prediction accuracy, class-wise accuracy, precision, recall, and F1-score.

Keywords- *Artificial Intelligence, Deep Learning, Ocular Diseases, Optical Coherence Tomography, Choroidal Neovascularization, Diabetic Macular Edema, Drusen.*

SMART TO DO LIST APPLICATION FOR OLDER ADULTS USING NLP

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Abstract- This paper introduces an AI-powered to-do list application specifically designed for older adults, focusing on enhancing usability through advanced Artificial Intelligence (AI) and Natural Language Processing (NLP) technologies. As people age, they may experience cognitive challenges such as forgetfulness or difficulty managing daily tasks. This system aims to alleviate these issues by providing intelligent task management features that adapt to the unique needs of each user, promoting independence and improving quality of life. At its core, the application offers a simple yet powerful interface for creating, updating, and tracking daily tasks. Leveraging NLP, users can input tasks through natural language, making it easy for older adults to interact using either voice commands or simplified text entries. This feature is critical for reducing complexity and improving accessibility for users who may struggle with traditional interfaces or are unfamiliar with modern technology.

Keywords- *Artificial Intelligence, Natural Language Processing, Task management etc.,*

AI-POWERED INTELLIGENT AUTOMATED DOCUMENT MANAGEMENT SYSTEM

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Abstract - The Artificial Intelligence-based Document Management System (AI-DMS) is aimed at automating document classification, extraction, and organization, improving accessibility and collaboration. With the integration of Natural Language Processing (NLP), Optical Character Recognition (OCR), and AI-generated metadata, the system facilitates intelligent processing of documents beyond the conventional approach. AI-DMS utilizes OCR software such as Tesseract and AWS Textract to digitize documents, whereas NLP algorithms such as spaCy and TensorFlow extract and categorize text. The system also automatically identifies important information such as dates, names, and numbers, creating metadata to enhance searchability. Semantic analysis enhances organization further by identifying document relationships. One of its strongest features is its version control and real-time collaboration, enabling several users to edit and monitor document changes effectively. It also has industry-specific workflows for industries such as legal, medical, and finance, accommodating domain-specific document handling requirements. Technically, the system is constructed using React.js for a responsive frontend and Flask/FastAPI for backend processing to facilitate quick and efficient document management. Unlike conventional OCR-based solutions, AI-DMS utilizes AI-driven tagging and deep semantic search, thus making retrieval more intuitive and efficient. The uniqueness of AI-DMS is its capability to increase document searchability and organization through AI-fueled intelligence, revolutionizing how businesses manage and access key information securely and efficiently.

Keywords- *Artificial Intelligence, Natural Language Processing, Optical Character Recognition*

AN INTELLIGENT RECOGNITION SYSTEM USING OPTIMISED ELMAN NEURAL NETWORK

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Abstract- The act of recognising an interior sensation or emotional state is described as facial expression. It is one of the effective techniques for interperson communication. They serve as indications that regulate interactions with those nearby. As a result, they are crucial in creating strong partnerships. In an effort to classify facial expressions, facial expression recognition systems try to extract features from facial photographs. This system is essential for enhancing computer-human interaction. The majority of facial emotion recognition research mainly relies on a reference facial model and well-known facial landmarks.For feature extraction from mammograms, Grey Level Co-Occurrence Matrix (GLCM) is used and feature reduction is done by Singular Value Decomposition (SVD) where the classification is done by Optimized Elman Deep Neural Network (OELDNN). The main intent of optimizing the OELDNN is to minimize the occurrence of error which in turn enhances the accuracy of classification.

Keyword- *Facial recognition, geometric feature, deep learning, auto-encoder, neural network, and classification.*

DESIGN OF IOT-ENABLED CROP HEALTH MONITORING AND PESTICIDE RECOMMENDATION SYSTEM

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Abstract- The growing demand for sustainable agriculture has created a need for innovative technical solutions to monitor crop health and optimize pesticide use. This idea describes the design and implementation of an IoT-enabled Crop Health Monitoring and Pesticide Recommendation System, which aims to improve crop management through real-time data collecting and analysis. The system uses IoT devices with sensors to monitor important environmental parameters including temperature, humidity, soil moisture, and light intensity, as well as crop characteristics like leaf health and pest infestations. Using a combination of machine learning algorithms and remote sensing data, the system accurately detects crop illnesses and pest infestations. Based on the information, it makes real-time pesticide recommendations adapted to individual conditions while minimizing environmental impact. The proposed system enhances decision-making for farmers, reduces over-reliance on chemical pesticides, and promotes sustainable farming practices, ultimately leading to improved crop yield and resource management.

ROAD IRREGULARITIES DETECTION USING DEEP LEARNING ALGORITHM

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Abstract- Poor road conditions are one of the major causes for road accidents. Developing countries in particular are witnessing increased accident rates due to these poor road conditions. Potholes, deep ridges, missing pitches, improper speed breakers, poorly constructed manhole covers and slabs all combine to greatly increase the probability of serious accidents thus transforming roads into obstacle courses. Road defects, such as potholes and cracks, are becoming an increasingly significant problem for roads around the world. They present a hazard for all road users, causing considerable vehicle damage. Road surface monitoring and maintenance are essential for driving comfort, transport safety and preserving infrastructure integrity. Traditional road condition monitoring is regularly conducted by specially designed instrumented vehicles, which requires time and money and is only able to cover a limited proportion of the road network. In light of the ubiquitous use of smartphones, this project proposes an automatic pothole detection system utilizing the built-in vibration sensors and global positioning system receivers in smartphones. We collected road condition data in a city using dedicated vehicles and smartphones. A series of processing methods were applied to the collected data, and features from different frequency domains were extracted. In this project we propose a method where we use the Tensorflow pretrained model and CNN algorithm (Convolution Neural Network) to detect the potholes, deep ridges and speed breakers. Our experimental results demonstrate high accuracy although there are many obstacles on the road.

DEEP LEARNING BASED UNDERWATER IMAGE ENHANCEMENT: A HYBRID APPROACH FOR OVERCOMING VISIBILITY CHALLENGES

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Abstract—Learning-based systems have shown significant potential in enhancing the quality of underwater photographs, which is crucial for studying, visualizing, and understanding marine ecosystems. Maintaining ecosystem equilibrium heavily relies on effective underwater monitoring; however, the inherent challenges of water refraction and absorption often result in images with reduced contrast and color fidelity. To address these issues, we propose a comprehensive framework for underwater image enhancement. Our method integrates several advanced techniques, including Red, Green, and Blue Histogram Shifting (RHGS), Dark Channel Prior (DCP) for haze removal, Multi-scale Image Processing (MIP) for optimal object visibility, Underwater Local Adaptation Processing (ULAP) for mitigating light scattering and backscattering, and Contrast Limited Adaptive Histogram Equalization (CLAHE) based on Rayleigh scattering for pixel correction. The effectiveness of our proposed framework is rigorously evaluated by comparing its performance against existing state-of-the-art methods, with a focus on key metrics such as Peak Signalto-Noise Ratio (PSNR) and Mean Squared Error (MSE). Our results demonstrate that the proposed approach significantly improves underwater image quality, offering a robust solution for enhanced underwater monitoring and analysis.

Keywords— *Image Enhancement; Restoration; CLAHE, Rayleigh, RGHS, DCP, MIP, and ULAP.*

THE ROLE OF ARTIFICIAL INTELLIGENCE IN DIGITAL MARKETING: A REVIEW

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Abstract- Digital marketing involves innovative techniques used to promote or advertise products, services or brands through digital channels, platforms, and technologies to reach a targeted audience. This type of marketing is quickly reaching customers via social networks through electronic devices. Digital marketing encompasses a wide range of strategies and tactics that help businesses engage with their audience through online platforms. This paper primarily focuses on the concept of digital marketing tools and AI techniques used for buying and selling products in the digital world. It also highlights the significant role of artificial intelligence in digital marketing, helping businesses optimize their strategies, enhance customer experiences, and boost performance.

Keyword- *digital marketing, artificial intelligent, customer, web marketing, technologies*

SMART ON-ROAD ASSISTANCE: AI-DRIVEN REAL-TIME VEHICLE SUPPORT AND EMERGENCY RESPONSE SYSTEM

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Abstract— The On-Road Vehicle Breakdown Assistance app lets users book mechanic appointments online. It displays available mechanics as tiles, Users can select a mechanic, book an appointment, and track it in a pending list. Mechanics can approve or reject appointments. The app also features a Google Maps view for convenience and allows users to update their appointments. On Road Vehicle Breakdown Assistance shall make possible efforts to locate and direct the nearest service provider to the user's location.

Keywords — Vehicle Breakdown Assistance, OnDemand Mechanic Service, Android Application, Firebase Database, GPS-Based Service

INFLUENCE OF AI: ROBOTICS IN HEALTHCARE - A REVIEW

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Abstract- The integration of artificial intelligence (AI) and robotics in healthcare has heralded a transformative era, offering unprecedented opportunities to enhance patient care, streamline processes, and augment medical professionals' capabilities. This review article examines the burgeoning influence of AI robotics in healthcare, encompassing various applications, benefits, challenges, and future prospects. We delve into the role of AI robotics across medical diagnosis, surgical interventions, rehabilitation, patient monitoring, and drug discovery. Additionally, we explore the ethical considerations, regulatory frameworks, and societal implications shaping the adoption and advancement of AI robotics in healthcare. By synthesizing current research and real-world implementations, this review elucidates the profound impact of AI robotics, paving the way for a revolutionized healthcare landscape.

Keywords- *Artificial intelligence, robotics, healthcare, medical diagnosis, ethical considerations.*

INCORPORATING METEOROLOGICAL DATA AND PESTICIDE INFORMATION TO FORECAST CROP YIELDS USING MACHINE LEARNING

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Abstract- The agricultural sector is increasingly vulnerable to the adverse effects of climate change and the overuse of pesticides, both of which pose significant threats to global food security. Accurately predicting crop yields is crucial for mitigating these risks and guiding sustainable agricultural practices. This study introduces an innovative crop yield prediction system that integrates a year's worth of meteorological data, pesticide usage records, crop yield data, and advanced machine learning techniques. We applied rigorous data gathering, cleaning, and enhancement procedures before training and evaluating three machine learning models: Gradient Boosting, K-Nearest Neighbors, and Multivariate Logistic Regression. To optimize model performance and reduce overfitting, we used GridSearchCV for hyperparameter tuning during K-Fold cross-validation. The Gradient Boosting model demonstrated exceptional accuracy, achieving an almost perfect coefficient of determination (R^2) of 99.99%, highlighting its potential for precise crop yield prediction. This research also analyzed the correlation between projected and actual crop yields and identified the ideal meteorological conditions for optimal crop performance. Ultimately, our findings promote data-driven approaches to sustainable agriculture and resource management, contributing to enhanced food security and resilience to climate changes

Keywords- *Gradient Boosting, K-Nearest Neighbors, Multivariate Logistic Regression ,Crop yield prediction, machine learning, deep learning.*

BIRTH DATA CLUSTER ANALYSIS: UNVEILING PATTERNS AND INSIGHTS

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Abstract—Analyzing birth data is crucial for understanding population dynamics, healthcare resource needs, and policy development. Traditional methods often miss complex relationships, whereas clustering techniques uncover hidden patterns among variables like maternal age, birth weight, prenatal care, and socioeconomic factors. This study applied kmeans and hierarchical clustering, with preprocessing steps including normalization, missing value imputation, and outlier detection. Clustering quality was evaluated using the silhouette score and Davies-Bouldin index. The results revealed key patterns, such as associations between higher maternal age and low birth weight and regional disparities in prenatal care access. Socioeconomic factors also influenced cluster characteristics, highlighting variations in maternal and infant health outcomes. These insights can inform public health policies, optimize healthcare resources, and support targeted maternal and infant care programs, demonstrating the value of data-driven approaches in healthcare planning.

Keywords— *Birth Data Analysis, Clustering Techniques, KMeans and Hierarchical Clustering, Maternal and Infant Health, Socioeconomic Factors*

TRANSFORMING CUSTOMER FEEDBACK INTO ACTIONABLE INSIGHTS THROUGH NLP BASED ANALYSIS

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Abstract- Customer feedback plays a crucial role in shaping business strategies by providing insights into customer satisfaction, preferences, and areas for improvement. However, the sheer volume of feedback received through digital platforms often makes manual analysis inefficient and impractical. To address this, Natural Language Processing (NLP) techniques offer an automated and scalable approach to analyzing customer feedback. This paper explores the use of NLP methods, specifically sentiment analysis and word cloud generation, to categorize and visualize customer feedback, ultimately providing businesses with actionable insights. In this study, customer feedback data was collected and analyzed using NLP techniques. Sentiment analysis was employed to classify feedback into three categories: positive, neutral, and negative. A pre- trained NLP model was used to assess the sentiment based on the words and context of the feedback. Additionally, a word cloud visualization was generated to identify the most frequently mentioned terms in the feedback data. This helped reveal key themes and topics that customers emphasized in their comments. The results of the sentiment analysis indicated that 70% of the feedback was classified as positive, 20% as neutral, and 10% as negative. The word cloud revealed that terms such as "Excellent," "Service," and "Quality" were commonly mentioned, highlighting areas of customer satisfaction, while words like "Poor" and "Slow" pointed to potential areas for improvement. This analysis demonstrates the effectiveness of using NLP techniques to analyze customer feedback efficiently and uncover valuable insights. The findings provide businesses with the necessary information to enhance their services, address concerns, and maintain high customer satisfaction levels.

Keywords- *Customer feedback, Natural Language Processing (NLP), Sentiment analysis, Word cloud, Text mining, Customer satisfaction, Service improvement, Data analysis.*

A SURVEY ON DEEP LEARNING -BASED OSTEOSARCOMA DIAGNOSIS USING TRANSFER LEARNING

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Abstract—Bone cancer specifically known as osteosarcoma primarily impacts children and younger adults. Identifying osteosarcoma at an initial phase is vital as it dramatically decreases the fatality rate and enhances the overall well-being of those affected. Advanced medical technologies are available, but Deep Learning has become a leading artificial intelligence approach for accurately identifying cancer when combined with suitable medical devices. The research in question examines many publications and interprets the results obtained. We evaluate deep learning techniques and imaging methods by analyzing their performance using metrics such as Accuracy, F1 Score, and Precision. The study will also utilize a transfer learning model in conjunction with deep learning techniques to improve Additionally, it addresses future research priorities by analyzing the employed methodologies and classifying the types according to the methods used. Ultimately, this study aims to reveal the existing research's shortcomings and underscore the necessity for additional research.. The primary objective of this research is to examine the different transfer learning models utilized in deep learning techniques to improve accuracy.

Keywords- *Deep learning, Osteosarcoma, Artificial Intelligence, Metrics, Transfer Learning.*

IOT AND WEARABLES: THE FUTURE OF PERSONAL HEALTH AND FITNESS TRACKING

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Abstract- IoT and wearable technology have transformed real-time monitoring and tracking in industries like maritime safety, health care and industrial work environments. This work presented an innovative IoT-based wearable system that allows the tracking and monitoring of deep-sea fishermen and their safety operating offshore. It consists of wearable sensors, an IoT gateway, cloud computing, and a real-time warning system. And collects GPS location, biometric data (heart rate, body temperature)The performance of the proposed system is assessed by major performance indicators such as sensitivity and specificity, accuracy like: GPS accuracy, delay, power efficiency, dependability, and alert response time.

Keywords- *Internet of things: Medical,health care,sports ,machine learning,wearable technology.*

IMPACT OF AUTOMATION ON EMPLOYMENT

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Abstract- This paper aims to review prior studies investigating how automation technologies affect employment. Our structured systematic review resulted in 102 publications recovered from Web of Science, Scopus and hand searching. The literature investigating how automation technologies affect employment is extremely complex and detailed, given that the impact of automation is evaluated at different levels of analysis (i.e., global, international, continental, country, regional, labour market, industry, firm, occupational, worker, and work activities) by adopting alternative methods (i.e., estimating the probability of automation or the net impact of employment) and, for some levels of analysis, the impact of each specific type of automation technology is evaluated. Moreover, the results are often inconsistent and inconclusive since only few clear results emerge and the impact of automation technologies is unclear for many levels of analysis. Research gaps and future research agenda are identified and discussed based on previous evidence.

Keywords- *Automation, Employment, Job Displacement, System Model, Performance Analysis, Economic Implications, Workforce Transition*

AI-POWERED MODULAR CHATBOT FOR ENHANCED CUSTOMER EXPERIENCE IN FOOD ORDERING APPLICATION

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Abstract— This paper presents a novel approach to enhance customer experience in food-ordering applications through the AI-operated modular chatbot system. We take advantage of a multi-agent architecture to create an individual, efficient ordering experience for the coffee shop customers, especially combined with LLAMA 3.1, especially LLAma 3.1, recovery-hired generation (rag) and market basket analysis. Our system appoints a coordinated team of particular agents-gord, classification, details, taking orders and recommended agents-grabbing interaction to handle different aspects of the interaction flow. The implementation displays significant improvements in order accuracy, recommended relevance and operational efficiency as compared to traditional ordering systems. Preliminary results indicate a 27% decrease in processing time and 32% increase in customer satisfaction score. This research contributes to the growing area of practical applications for modular AI systems in retail environment and provides a scalable structure for equal implementation in the food service industry.

Keywords— *large language models, chatbots, multi-agent systems, retrieval-augmented generation, market basket analysis, food ordering, personalized recommendations*

EARLY DETECTION AND CLASSIFICATION OF PLANT LEAF DISEASES USING LOOP LEARNING FOR CROP PROTECTION

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Abstract- Agriculture plays a crucial role in global food production, and plant diseases pose a major threat to crop yield and quality. Early and accurate detection of plant diseases is essential to prevent large-scale losses. Traditional disease detection methods rely on manual inspection, which is time-consuming, expensive, and often inaccurate. To address this challenge, this project presents an automated Plant Leaf Disease Detection System using Deep Learning with Convolutional Neural Networks (CNN). CNNs are highly effective in image classification tasks due to their ability to extract meaningful features from images. The proposed system takes leaf images as input, preprocesses them, and classifies them into healthy or diseased categories based on a trained deep learning model. The dataset consists of various plant leaf images with different diseases, and the model is trained to identify patterns, textures, and colors that indicate disease symptoms. By leveraging deep learning, the system achieves high accuracy in disease detection, reducing the dependency on human expertise. The model is optimized for efficiency, ensuring real-time detection with minimal computational cost. This technology is particularly beneficial for farmers and agricultural researchers, enabling them to take timely corrective measures. The proposed system can be deployed on mobile devices, IoT platforms, and cloud-based applications for widespread accessibility. With the increasing demand for precision agriculture, integrating AI-based solutions like this can enhance crop management and sustainability. The Plant Leaf Disease Detection System using CNN provides a fast, reliable, and cost-effective approach to plant disease diagnosis, helping improve overall agricultural productivity.

MULTICAMERA VIDEO SURVEILLANCE FALL DETECTION SYSTEM FOR ELDERS

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Abstract- Video Surveillance is an omnipresent topic when it comes to enhancing security and safety in the intelligent home environment. Artificial vision provides a remarkable good sensor. Cameras are passive sensors that supply a great amount of information. In this project we develop an application for elderly care that detects falls or faints and automatically triggers the health alarm. In this work, we propose a human-shape-based falling detection algorithm and implement this algorithm in a multi-camera video surveillance system. This algorithm uses multiple cameras to fetch the images from different regions required to monitor. It then uses a falling-pattern recognition approach to determine if an accidental falling has ccurred. If yes, the system will trigger the health alarm. It should not reset within few seconds system automatically sends short messages to someone needs to alert. Furthermore, we use the speed of fall to differentiate real fall incident and an event where the person is simply lying without falling.

Keywords- *passive sensors, video surveillance,pattern recognition, speed of fall*

LEVERAGING CRM DATA QUALITY BY USING MACHINE LEARNING AND BIG DATA

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Abstract— This project is mainly based on CRM data integrity through the use of machine learning and big data principles like K-means clustering for customer segmentation and outlier detection. It validates data automatically in the sales force to provide accurate insights for decision-making for improved businesses.

Keywords—CRM, ML, Big Data, K-Means Clustering, Salesforce, Data Analysis, Customer Segmentation and BI.

ENHANCING THE QUALITY OF LIFE FOR INDIVIDUALS WITH EPILEPSY THROUGH REAL-TIME SEIZURE DETECTION UTILISING MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE TECHNOLOGIES

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Abstract- The incorporation of machine learning and artificial intelligence (AI) technologies within the healthcare sector has facilitated novel opportunities for enhancing the quality of life for individuals afflicted with epilepsy. Through the utilization of real-time seizure detection mechanisms, these sophisticated technologies are capable of delivering immediate notifications to caregivers and healthcare practitioners, thereby enabling swift intervention during seizure episodes. This anticipatory methodology not only augments patient safety but also facilitates autonomy among individuals diagnosed with epilepsy by fostering independence and mitigating the anxiety linked to prospective seizure occurrences. Recent progressions in wearable technologies integrated with sensors proficient in the surveillance of physiological indicators, including heart rate, locomotion patterns, and electroencephalogram (EEG) data, have markedly enhanced the precision of algorithms designed for seizure detection. These advancements are establishing a foundation for individualized therapeutic strategies, enabling medical practitioners to customize interventions according to specific patient information and seizure characteristics. Consequently, patients are afforded the opportunity to derive advantages from enhanced management methodologies that not only mitigate acute seizure threats but also foster long-term health advantages and enhancements in overall quality of life.

REVAMPING THE LANDING PAGE AND LEARNING MANAGEMENT SYSTEM

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Abstract —This paper presents the redevelopment of EnsureSafe Singapore's Learning Management System (LMS) and landing page using modern web technologies to improve performance, accessibility, and user experience. The system is built using Next.js for server-side rendering, TanStack Query for optimized API handling, and Tailwind CSS for a responsive UI. Authentication is managed through CLERK for secure login and signup. Google Cloud is leveraged for storage and deployment, ensuring scalability and reliability. The proposed system enhances course management, user engagement, and SEO optimization, providing a seamless learning experience.

Keywords—*Learning Management System, Next.js, CLERK authentication, Google Cloud, SEO optimization, responsive UI.*

LUNG CANCER MACHINE LEARNING BASED APPROACH USING SVM

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Abstract- Support Vector Machines (SVM) are powerful supervised learning methods that utilize associated learning techniques to analyze data and identify patterns, primarily used for classification tasks. The fundamental idea behind SVM is to process a given set of data and determine which of two classes the input belongs to, functioning as a non-probabilistic binary linear classifier. With a set of training examples, each labeled with one of two categories, an SVM learning algorithm builds a model that can categorize new cases into one of the two classes. In this research, we propose a method that employs a linear SVM classifier for detecting lung cancer. The choice of a linear classifier is based on its straightforwardness and effectiveness in highdimensional environments. The proposed system is trained using a dataset that includes medical images and patient data, with each instance labeled as either suggesting the presence of lung cancer or not. The SVM model is used to classify new instances based on the patterns learned during training. The results of our experiments show that the developed system achieves a higher accuracy rate in lung cancer diagnosis compared to traditional methods. The linear SVM classifier effectively differentiates between cancerous and non-cancerous cases with commendable accuracy, providing a reliable tool for early diagnosis and treatment decision-making. This paper highlights the SVM's efficiency as a valuable asset in the medical field, particularly in enhancing the precision and effectiveness of disease detection systems..

Keywords- *Support Vector Machines (SVM), supervised learning, Model construction, linear classifier, Lung cancer detection, High-dimensional spaces, Medical images.*

WEB ENABLED PADDY CLEANER AND PACKAGING SYSTEM

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Abstract - The Web-Enabled Paddy Cleaner and Packaging System automates and optimizes the post-harvest process by integrating an embedded system with real-time connectivity to a web server. This system allows administrators to remotely monitor and control machine settings, analyze performance, and perform maintenance. Farmers can track the status of their paddy, receive alerts, and request services. By streamlining cleaning and packaging operations, the system enhances productivity, transparency, and decision-making for both farmers and administrators.

OPTIMIZATION OF THERMODYNAMIC PERFORMANCE METRICS FOR BRINE-TO-FLUID HEAT EXCHANGERS

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Abstract- This project focuses on designing a high-performance heat exchange system that efficiently transfers thermal energy from a water body to residential buildings. The system begins by analysing key data related to both the water source and residential properties to customize the heat exchange process. A comprehensive evaluation of heat transfer characteristics within the piping infrastructure is conducted, including pipe dimensions, insulation properties, and heat transfer coefficients to ensure maximum efficiency. A Decision Tree Regressor algorithm is employed to model the relationship between critical input parameters and heat transfer performance, offering insights to optimize system design. Additionally, the project evaluates various brine solutions, analysing their concentration and thermal properties to enhance heat transfer efficiency. The system's real-world effectiveness is then assessed by monitoring its impact on indoor temperatures, ensuring reliable and efficient temperature management. By combining advanced analytical techniques with practical evaluation, this project delivers a robust solution for sustainable and effective residential heating.

Keywords- *Decision Tree Regressor, Heat exchange system, Thermal energy transfer, Brine solutions, Energy efficiency.*

SMART LIGHT PATH USING IOT

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Abstract— The Smart Light Path using IOT project employs Arduino technology to develop a smart lighting system that greatly improves indoor navigation and safety. On the contrary, infrared sensors can detect motion by detecting alterations in temperature, guaranteeing that even small movements will be recorded. When a user gets closer, the Arduino analyzes the information and turns on the LED lights, lighting up changing paths according to how close they are. The LED lights are both energy-efficient and adaptable, adjusting their brightness and color based on user preferences or specific circumstances, like dimming with increasing ambient light or brightening in dark environments..

Keywords— *UNO,LED,IOT*

A STUDY ON WORKFORCE PLANNING AND OPTIMIZATION USING DATA ANALYTICS IN SOMU SOLVENTS PVT, LTD., AT BANGALORE

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Abstract --- In the era of digital transformation, workforce analytics has become an essential tool for organizations aiming to enhance efficiency, optimize resource allocation, and improve talent management. By leveraging data analytics, businesses can move beyond traditional workforce planning methods and adopt a data-driven approach to decision-making. This study explores the role of workforce analytics in forecasting staffing needs, tracking employee performance, and aligning workforce strategies with business objectives. Through the application of predictive analytics, artificial intelligence, and machine learning, organizations can enhance employee retention, improve productivity, and reduce operational costs. The findings of this research highlight the benefits of integrating data analytics into workforce planning and suggest strategic solutions for overcoming implementation challenges. Ultimately, the study underscores the necessity of a data-driven culture to foster agility, competitive advantage, and long-term business sustainability.

Keywords --- *Workforce analytics, data-driven HR, predictive analytics, workforce optimization, machine learning, employee performance.*

A STUDY ON ASSESSING EFFECTIVE CHANGE MANAGEMENT IN ORGANIZATIONAL CHANGE IN SHRI AMMAN STEEL AND ALIED INDUSTRIES PVT LTD AT TRICHY

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Abstract— This research investigates the change management impact of democratic leadership, communication, and corporate culture on employee resistance to change within SHRI AMMAN STEEL & ALLIED INDUSTRIES PVT LTD, Trichy. Employing a cross-sectional, descriptive, and exploratory quantitative design, the study utilizes questionnaires. Statistical analyses, including correlation tests, percentage analysis, independent sample t-tests, and descriptive statistics, are conducted. We hypothesize that democratic leadership significantly reduces resistance to change, testing the null hypothesis (H0): no significant difference in resistance between employees under democratic and other leadership styles, against the alternative (H1): a significant difference exists. Additionally, we examine the relationships between leadership, communication, and work culture, testing H0: no significant relation, against H1: a significant relation. The findings aim to quantify the influence of these factors on employee behavior and organizational productivity during change initiatives. This study will provide practical insights for optimizing change management within the steel industry, enhancing organizational adaptation and performance.

Keywords- *Change Engagement, Communication, Leadership, Technology, Incremental change, Work culture, Resistance to change*

A METHODOLOGY TO COMBINE INTERVAL VALUED PICTURE FUZZY FOCAL ELEMENTS AND THEIR BASIC PROBABILITY ASSIGNMENT IN EVIDENCE THEORY

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Abstract- In this paper, we introduce the concept of picture fuzzy sets (PFS), which are fuzzy sets and a direct extension leading to intuitive fuzzy sets. Using Dempster-Shafer theory (DST) evidence, a method is proposed to combine the three variables of interval-valued picture fuzzy focal elements (PFFEs) and their associated basic probability assignments (BPAs). Four new operations are introduced on interval-valued picture fuzzy sets using evidence theory and modified arithmetic operation on interval-valued picture fuzzy sets. Also, we develop new python program for Interval valued picture fuzzy set (IVPFS).

Keywords- *Dempster- Shafer Theory (DST), Basic Probability Assignments, Picture fuzzy sets, Interval Valued Picture fuzzy Number(IVPFN), Modified arithmetic operations*

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN AGRICULTURE: TRANSFORMING FARMING SYSTEMS

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Abstract- The agricultural sector plays a vital role in sustaining human civilization by providing food, fiber, and raw materials. Technological advancements, particularly. Artificial Intelligence (AI) and Machine Learning (ML), have significantly transformed agriculture. This article explores how AI and ML are revolutionizing farming systems across crop production, animal husbandry, aquaculture, forestry, and agribusiness. These technologies are essential for addressing challenges like limited resources, climate change, and population growth. AI and ML contribute to increased productivity, precision farming, efficient resource management, and enhanced disease and pest control. They also optimize supply chains and enable more accurate monitoring of crops, soil, and livestock. AI-powered tools, including agricultural robotics and drones, have further streamlined processes. The integration of AI and ML in agriculture promises to improve sustainability, reduce resource waste, and support data-driven decision-making, ultimately fostering a more efficient and resilient agricultural system.

Keywords *- Artificial Intelligence, Machine Learning, Decision Trees, Random Forests, Support Vector Machines, · Neural Networks, K-Nearest Neighbors, Blockchain, Edge Computing*

STROKE DETECTION HAND BAND USING EMG

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Abstract— Stroke counts as a leading reason for disability and decease all over the world and it usually involves immediate medical responses. This study aims at showing a wearable stroke detection system, which is likely to be a hand band with medical sensors. The system is interfaced with the main controller (ESP8266), the stroke detection sensor (EMG), and the real-time communication module (SIM800L GSM). The collected data is processed in order to allow an early signal detection, which shall automatically alert the operators in the form of a mobile call to the caregivers or emergency services when a particular signal is detected. This IoT-based platform presents a technological, cost-benefit, and successful solution towards the early detection of stroke to improve treatment and response protocol.

Keywords— *EMG – Electromyography ,ESP8266 – Espressif Systems Processor 8266,SIM800L GSM - SIMCom 800L Global System for Mobile Communications Module*

FAKE JOB DETECTION USING MACHINE LEARNING

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Abstract- An application using machine learning- based categorization algorithms is presented in the project to prevent fraudulent job postings online. The outputs of various classifiers are evaluated in order to determine the best employment scam detection model. These classifiers are used to verify fraudulent posts on the web. It assists in identifying job postings among a large number of postings. For the purpose of identifying fake job postings, two main categories of classifiers—single classifiers and ensemble classifiers—are taken into consideration. However, experimental findings show that ensemble classifiers are superior to single classifiers in their ability to detect fraud.

Keywords- *Ensemble Classifiers, Machine Learning, Fraudulent Job, Fraud Detection*

IOT-BASED SMART CHARGING AND ML-DRIVEN FAULT DETECTION SYSTEM FOR ELECTRIC VEHICLES

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Abstract- The adoption of Electric Vehicles (EVs) is increasing, but challenges like inefficient charging and unpredictable failures persist. This paper presents an IoT-based smart charging system integrated with Machine Learning (ML)-driven fault detection to optimize energy consumption, improve battery life, and enable predictive maintenance. The system leverages real-time data analytics for intelligent charging schedules and fault detection algorithms to minimize downtime. A prototype system was developed and tested under simulated conditions, demonstrating an 18% reduction in energy consumption, a 20% improvement in fault detection accuracy, and enhanced reliability. This research contributes to the development of intelligent EV charging infrastructure.

Keywords— *IoT, Smart Charging, Machine Learning, Fault Detection, Electric Vehicles.*

PIONEERING ADVANCED RESCUE SOLUTIONS FOR DRAINAGE AND DEEP HOLES

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Abstract— Uncovered drainage systems, open manholes, and deep borewells have led to numerous fatalities in India. To address this issue, an IoT-based monitoring and rescue system is designed to detect human falls, hazardous gases, and rising water levels while providing real-time alerts and enabling rapid emergency response. Ultrasonic sensors continuously monitor open areas for movement, while an MQ-2 gas sensor detects toxic fumes like methane and carbon monoxide. Water level sensors help prevent flood-related hazards, ensuring safety during heavy rains. An automated hydraulic rescue mechanism, positioned 8 feet deep, can be remotely activated by authorized officials to lift trapped individuals to safety. Additionally, a metal slab at a depth of 7 feet acts as a safeguard to prevent fatalities. The system integrates GSM and Wi-Fi communication for instant alerts and a centralized controller for efficient multi-location monitoring. A user-friendly dashboard on the Blynk IoT application provides real-time data access, emergency notifications, and remote control of the rescue mechanism. By combining IoT technology with automated safety solutions, this system offers a scalable and effective approach to preventing drainage-related accidents and ensuring public safety.

F2WO-CSTR: A NONLINEAR PROCESS CONTROLLER FOR CSTR USING FUZZY 2 STAGE WHALE OPTIMIZATION

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Abstract—The CSTR is a general ideal reactor in chemical engineering. A CSTR indicates a design adopted to evaluate the key unit function variables by means of a continuous agitated-tank reactor to attain a particular output. The CSTR design is mostly adopted to make simpler the engineering computations and can be employed to portray research reactors. Moreover, it provides major advantages regarding performance and versatility. The drawback with a CSTR is that it can be comparatively uneconomical on product throughout startup and shutdown processes. Therefore, this paper intends to develop a nonlinear process controller based on the principles of WOA principles and FIS termed as F2WO-CSTR to facilitate the controlling operation of CSTR. The whale optimization algorithm is used to define the gain vectors of CSTR for Fuzzy rule generation and Fuzzy membership function optimally. Based on the membership function, the FIS defines the controlling gains of CSTR controller. The variation between the error and differential error should be minimized which is considered as the objective function for which the fuzzy rules and membership values are defined. The resultant CSTR process with the proposed controller is subjected to testing under a disturbance with the intent of maintaining the minimized error variation.

Keywords—*CSTR; Controller, Gain vectors, Fuzzy Interference System, Whale Optimization*

WATER BODY AREA MEASUREMENT FROM SATELLITE IMAGE USING DEEP LEARNING

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Abstract-- Separating land cover from plant and water body areas in satellite pictures is crucial for planning and developing both rural and urban areas. The existing land cover categorization methods require large sample image collections for training. Due to heterogeneous pixels and geometric distortion over boundaries and curvature zones, it is difficult to classify the area of water body cover of plant and water areas using current methodologies. Mixed pixels affect the precision of land cover classification and measurement. In this work, the water and plant areas in the land cover of LANDSAT photos are enhanced and classified using transverse dyadic wavelet transform (TDyWT)[2], which eliminates the need for training datasets. The TDyWT's reversible and lifting wavelet characteristics improve the shape, tilt and the plant-water boundary[1] regions of the LANDSAT pictures TDyWT eliminates mixed pixel geometric distortion and spatial scale[1] inaccuracy. Classical land surveying minimizes spatial scale inaccuracy utilizing complete station and errors modeling methodologies. In comparison to ground truth survey approaches, the findings demonstrate that the recently discovers the TDyWT algorithm determines the area of subfield of water and vegetation with 95.02% accuracy. We are suggested method measured the areas of water bodies with a high degree of accuracy when tested using a dataset of satellite photos

Keywords-- *Denoising convolutional neural network(DnCNN), geometric distortion, land cover classification, remote sensing, and transverse dyadic wavelet transform*

About the College

A.V.C.College of Engineering, etablished in 1996, is located on the main highway from Mayiladuthurai to Thirukadaiyur in the scenic landscape of Mannampandal, Mayiladuthurai District, Tamilnadu, spread across 30.09 acres.The institution offers eight UG and two PG programmes. It is Accrediated by NBA for the CSE, EEE, ECE and MECH programmes. Additionally it is Accredited by NAAC with an 'A' Grade (3rd Cycle).Renowned for its commitment to academic excellence and holistic developemnt, the institution continues to produce competent professionals equipped to meet global challenges while contributing to society.

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