ICCiEST

International Conference on Computational Intelligence, Electronics, and Smart Technologies

April 08-09, 2026

Moodlakatte Institute of Technology & Management, Mudalkatte, Karnataka

INDEX

About Moodlakatte Institute of Technology (MITK)

Established in 2004 under the visionary leadership of the philanthropic technocrat Late I. M. Jayaram Shetty and the esteemed MNBS Trust, Moodlakatte Institute of Technology (MITK) has been committed to empowering rural communities through quality technical education. The institution has emerged as a beacon of hope for students from economically disadvantaged backgrounds, enabling them to pursue professional engineering education and realize their dreams of becoming competent entrepreneurs, technocrats, and professionals.

Expanding its academic excellence, MITK introduced postgraduate management programs in 2008, offering a two-year full-time MBA program for graduates from technical and humanities backgrounds

MITK is affiliated with Visvesvaraya Technological University, Belagavi, approved by All India Council for Technical Education, New Delhi, and accredited by National Assessment and Accreditation Council in 2024

Overview

With the rapid growth of professional engineering education across India, a significant transformation emerged in the coastal district of Udupi—an evolving hub for higher education. This progress inspired visionary entrepreneurs from the Kundapur region to contribute to regional development through the establishment of industries, hospitality ventures, and educational institutions.

Recognizing the need for accessible and quality education in rural areas, the MNBS Trust was established in 1995 at Moodlakatte by the family of Late I. M. Jayaram Shetty. The trust's mission is to promote education along with social and cultural development in rural communities.

MITK stands out for its commitment to equal educational opportunities, fostering critical thinking, analytical skills, and logical reasoning. The institution inspires students to address societal challenges with a strong technical and entrepreneurial mindset, continuously striving for excellence.

MITK offers a wide range of undergraduate engineering programs along with postgraduate management education, preparing students for successful careers and leadership roles.

Vision

To be a leading hub of higher education in Technology and Management by imparting quality education with a focus on creativity, innovation, and social values—thereby inspiring, motivating, and empowering young minds

Mission

- Toprovide a dynamic academic environment that nurtures comprehensive and holistic education.
- Tofacilitate industry collaborations that enhance practical skills and foster entrepreneurial spirit.
- Toencourage creativity, innovation, and research through advanced infrastructure and expert faculty.
- Tocultivate personal growth, professional competence, ethical values, and a strong sense of social responsibility

Message

Shri Siddhartha J. Shetty
Chairman
Moodlakatte Institute of Technology, Kundapura

It gives me immense pleasure, as Chairman of the Institute, to extend a warm and cordial welcome to all distinguished delegates, eminent scholars, industry experts, and participants to the International Conference on Computational Intelligence, Electronics and Smart Technologies (ICCiTEST-26), organized by Moodlakatte Institute of Technology, Kundapura, Karnataka.

This prestigious conference represents a significant milestone in our continued commitment to fostering innovation, advancing research, and strengthening global collaboration. In an era defined by rapid advancements in Artificial Intelligence, Computational Intelligence, and Smart Technologies, it is imperative to create dynamic platforms that facilitate the exchange of knowledge, ideas, and cutting-edge technological developments.

ICCiTEST-26 aspires to bring together brilliant minds from academia, industry, and research institutions to deliberate on emerging trends and transformative innovations in computational intelligence, electronics, and smart systems—fields that are profoundly shaping the future of technology and society. Such an academic congregation not only promotes interdisciplinary research but also serves as a source of inspiration for young researchers to pursue excellence and contribute meaningfully to scientific and technological progress.

I am confident that this conference will serve as a vibrant forum for intellectual engagement, enabling participants to share innovative ideas, forge meaningful collaborations, and explore practical solutions to real-world challenges through advanced technologies.

I extend my sincere appreciation to the organizing committee for their dedicated efforts and convey my best wishes to all participants for a highly enriching and successful conference.

Message

Dr. Shankaranarayana Bhat M
Director Academic
IMJ Institutions, Kundapura

It is a matter of great pleasure and pride that the enthusiastic team of researchers at Moodlakatte Institute of Technology, Kundapura (MITK), has successfully organized the International Conference on Computational Intelligence, Electronics and Smart Technologies (ICCiEST).

The conference covered a wide range of topics that are not only comprehensive but also highly relevant to the contemporary research community. I am pleased to note that the organizing team has received a good number of quality research articles, which is an encouraging sign of the growing research culture and academic excellence within the community.

I extend my heartfelt congratulations to all the researchers for their outstanding contributions toward the advancement of knowledge. I also take this opportunity to congratulate the organizing team for their excellent efforts in conducting the conference successfully and for systematically compiling the proceedings for the benefit of researchers.

I am confident that this volume will serve as a valuable repository of knowledge for researchers and academicians alike. I convey my best wishes to all readers and contributors.

Message

Dr. Ramakrishna Hegde
Principal
MIT Kundapura

It gives me immense pleasure to welcome you to the International Conference on Computational Intelligence, Electronics and Smart Technologies (ICCiTEST-26) at Moodlakatte Institute of Technology, Kundapura, Karnataka. This conference is a significant milestone in our path for upgrading human intelligence fortechnological breakthroughs in the era of Artificial Intelligence. I am confident ICCiTEST-26 will be a platform for collaboration and exchange of great ideas.

Message

Dr. Indra Vijay Singh
(Ex-Scientist) Convener & Dean Research and Consultancy
MIT Kundapura

It gives me immense pleasure to welcome you all to the International Conference on Computational Intelligence, Electronics, and Smart Technologies. This conference serves as a dynamic platform for researchers, academicians, industry professionals, and students to come together and exchange innovative ideas, recent advancements, and future directions in these rapidly evolving domains.

In today's world, computational intelligence and smart technologies are transforming every aspect of human life—from intelligent automation and data-driven decision-making to advanced electronic systems that power modern infrastructure. This conference aims to foster interdisciplinary collaboration and encourage the integration of theory, research, and practical applications.

We have curated a comprehensive program that includes keynote speeches by eminent experts, technical paper presentations, workshops, and panel discussions. These sessions are designed to inspire knowledge sharing, promote innovation, and address real-world challenges through cutting-edge research.

I extend my heartfelt gratitude to all the participants, speakers, organizing committee members, and sponsors for their valuable contributions in making this event possible. Your active involvement is the cornerstone of this conference's success.

I encourage all attendees to actively participate, engage in meaningful discussions, and build collaborations that will contribute to technological advancement and societal development.

Wishing you all a productive and enriching conference experience.

Message

Shri Vijayant Gaur (Chief Guest)
Director General, Cyber Security Association of India , NewDelhi
Chief Advisor, Center of Excellence, MITK

It is a great privilege to be part of the International Conference on Computational Intelligence, Electronics and Smart Technologies (ICCCIEST-2026).

I sincerely congratulate the organizers for bringing together experts, researchers, and students on this valuable platform.

In today's fast-changing digital era, advancements in computational intelligence, cyber immunity, and digital forensics are crucial for building secure and intelligent systems. Such conferences play an important role in promoting innovation, collaboration, and practical solutions to real-world challenges.

I commend the organizing team for their efforts and wish all participants a productive and insightful experience.

Best wishes for the grand success of ICCCIEST-2026.

Key Note Speaker

Lt. Col. (Dr.) Santosh Khadsare (Retd.) (Guest of Honour)
VP – DFIR | Cyber Security Expert | Indian Army Veteran

It is a great honor to be a part of the International Conference on Computational Intelligence, Electronics and Smart Technologies (ICCiTEST-26).

This conference provides an excellent platform for sharing knowledge, innovative ideas, and fostering collaboration in emerging technological domains. I appreciate the efforts of the organizers in bringing together experts and young minds under one roof.

I extend my best wishes to all participants for a successful and enriching conference.

Key Note Speaker

Dr. Rohini R Rao (KeyNote Speaker)
Associate Professor
School of Computer Engineering, MAHE Manipal

It is a great pleasure to be a part of the International Conference on Computational Intelligence, Electronics and Smart Technologies (ICCiTEST-26) organized by Moodlakatte Institute of Technology, Kundapura, Karnataka.

Conferences like ICCiTEST-26 provide an excellent platform for sharing knowledge, exploring innovative ideas, and fostering collaboration in the rapidly evolving fields of Computational Intelligence and Smart Technologies. Such initiatives play a vital role in inspiring young researchers and promoting advancements in science and technology.

I appreciate the efforts of the organizing committee in bringing together academicians, researchers, and industry experts to exchange ideas and discuss emerging trends.

I extend my best wishes to all participants for a successful and enriching conference.

Conference Organizing Committee

Chief Patrons:

- Mr. Shri Siddhartha J. Shetty, Chairman, Moodlakatte Institute of Technology, Kundapura, Karnataka.

Patrons:

- Dr. S.N Bhat, Director, IMJ Group of Institutions
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- Dr. Indra Vijay Singh, Dean – Research & Consultancy and Director of Centre of Excellence

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- Mr. Amresh Kumar, Assistant Professor, Dept of AIML
- Dr. Nikhila Pai, Dept of BSH
- Dr. Nandini, Head – MCA
- Dr. Suchitra Pojary, Head – MBA

Conference Schedule

International Conference on Computational Intelligence, Electronics and Smart Technologies (ICCiEST -2026)		
SCITEPRESS		
Venue: - Moodlakatte Institute of Technology, Kundapura, Karnataka		
08th April 2026		
Conference Main Schedule		
Time	**Events**	**Hall**
09.30 AM - 09.32 AM	Inaugural Ceremony: Invocation	Auditorium
09.32 AM - 09.34 AM	Welcome Address	
09.34 AM – 09.36AM	Conference Overview: Dr. Indra Vijay Singh (Dean R&C, MITKundapura)	
09.36 AM - 09.38 AM	Lighting of the Ceremonial Lamp	
09.38 AM - 09.40 AM	Introduction of the Chief Guest: Shri. Vijayant Gaur Director General, Cyber Security Association of India -New Delhi, Chief Advisor Center of Excellence , Cyber immunity & Digital Forensics , MITK	
09.40 AM - 09.50 AM	Address by the Chief Guest	
09.50 AM - 09.52 AM	Introduction of the Guest of Honour Lt. Col. (Dr.) Santosh Nathuram khadsare , Army veterans, and expert of Cyber security digital forensics and Incidents response	
09.52 AM - 09.57 AM	Address by the Guest of Honour	
09.57 AM - 10.02 AM	Address by the Principal, MITK: Dr. Ramakrishna Hegde	
10.02 AM - 10.07 AM	Presidential Address by Director Academics, IMJ Institutions Dr. S N Bhat	
10.07 AM - 11.07 AM	Keynote Session: Talk by Guest of Honour Lt. Col. (Dr.) Santosh Nathuram khadsare , Army veterans, and expert of Cyber security digital forensics and Incidents response	
11.07 AM - 11.10 AM	Vote of Thanks	
11.10 AM - 12.00 PM	Networking Tea Break	Badmition court

Conference Schedule

International Conference on Computational Intelligence, Electronics and Smart Technologies (ICCiEST -2026)		
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08th April 2026		
Conference Main Schedule		
Time	**Events**	**Hall**
12.00 PM - 01.00PM	Technical Session (Offline)	Center of Excellence lab
01.00 PM - 02.00PM	Lunch Break	Badmition court
02.00 PM - 04.00PM	Technical Sessions: Parallel Online Tracks (Tracks 1–7)	Center of Excellence lab
04.00 PM - 04.30PM	Adjournment of Day 1	

Conference Schedule

PROGRAMME FLOW: DAY 2

International Conference on Computational Intelligence, Electronics and Smart Technologies (ICCiEST -2026)		
SCITEPRESS		
Venue: - Moodlakatte Institute of Technology, Kundapura, Karnataka		
09th April 2026		
Conference Main Schedule		
Time	**Events**	**Hall**
9.00 AM - 10.00 AM	Commencement & Day 1 Retrospective	
10.00 AM - 11.00 AM	Keynote Session (Offline): Talk by Dr. Rohini Rao	Auditorium
11.00 AM - 12.00PM	Keynote Session Talk by Dr. Vidya Rao	Auditorium
12.00 PM - 01.00 PM	Panel Discussion	Board Room
01.00 PM - 02.00 PM	Lunch Break	Batmition court
02.00 PM - 04.00 PM	Technical Sessions: Parallel Online Tracks (Tracks 8–15)	Center of Excellence Lab
04.00 PM - 04.15 PM	Valedictory Ceremony	Auditorium
04.15 PM - 04.30 PM	Felicitation of Guests & Resource Persons	Auditorium
04.30 PM - 04.45 PM	Distribution of Certificates	Auditorium
04.45PM - 04.47 PM	Conclusion of Conference	Auditorium

Paper ID: 13

VISUAL MONITORING AND ANALYSIS OF WIND TURBINE SYSTEM WITH SPLUNK

Manimegalai somasundaram

Abstract: Wind turbines are a key source of renewable energy; to operate at maximum efficiency and reliability it requires continuous monitoring. Splunk a powerful data analysis and visualization tool, was implemented in this work to analyse wind turbine sensor data. The data contains measurements for monitoring the performance and identifying issues in turbine speed, vibration, temperature, and power generation. These data's can be organized to highlight patterns and trends with the help of Splunk and custom dashboards display information clearly, allowing real-time and continuous monitoring. Alerts were also set up to notify operators when key parameters exceeded acceptable thresholds. These features help to easily spot and respond to issues in wind turbines before they lead to major problems.

Paper ID: 14

VEHICLE NAVIGATION SYSTEM TURN INDICATOR

Dr. Priyanka More

Abstract: A vehicle navigation system to give a better notification of the upcoming turns of a particular route is revealed. Such turn notifications are ideally the process of turning turn signal indicators within or without the vehicle based on the turn notification provided by the navigation system. The system makes use of the existing turn signal indicators such as those available on the instrument cluster, external lights, and side mirrors, and this feature, makes the implementation of the system simple and economical. Through warning the occupant of the vehicle as well as the other road users, the system is set to increase the safety and awareness of the route that the driver intends to take. Also, there is a possibility of a heads-up display (HUD) to carry out the notifications, which is advantageous because it will not be out of the view of the driver.

Paper ID: 22

DUAL-STREAM EFFICIENT NET-BASED DEEP LEARNING ARCHITECTURE FOR AUTOMATED KNEE OS-TEOARTHRITIS SEVERITY CLASSIFICATION

reddy, muthyala*; mokkalakathi, Bindu

Abstract. Knee osteoarthritis (KOA) is an inflammatory degenerative joint disease, which should be diagnosed in time and properly to prevent disability and enhance patient outcomes. The last few years bore witness to great possibilities of deep learning models, in particular Convolutional Neural Networks (CNNs) in automatically classifying KOA se-Verity based on radiographic images. This paper presents a new dual-stream CNN model with EfficientNetB0 to predict the level of KOA according to the KellgrenLawrence (KL) grading system. The model is compared to some of the most popular architectures, including ResNet-50, VGG16, and DenseNet121 based on the proposed model using the performance measures, which include accuracy, precision, recall, F1-score, and AUC (Area Under the Curve). It has been experimentally shown that the dual-stream EfficientNetB0 model has better per-performance with an accuracy of 92 percent, a precision of 91.5 percent, a recall of 91.8 percent, and an AUC of 0.94. These results prove that the suggested architecture is a prospective solution to automated KOA se-verity evaluation in the clinical setting that provides excellent predictive per-formance and allows the use of the suggested architecture in real-life scenarios.

Paper ID: 23

ANOMALY DETECTION IN STREAMING DATA: A REVIEW TECHNIQUES AND CHALLENGES

Akuri, Sree Rama Chandra*

Abstract. In streaming data, anomaly detection plays a significant role in a wide range of real-world applications, including fraud detection, system monitoring, as well as network security. A significant challenge in this domain is concept drift the dynamic change in data distribution over time which can severely affect the accuracy and reliability of anomaly detection algorithms. These algorithms must be capable of adapting to evolving patterns in real-time to maintain performance. Despite its critical importance, there is currently no standardized evaluation framework for assessing the robustness and effectiveness of streaming anomaly detection methods under various types of concept drift and anomaly conditions. This review paper aims to fill this gap by first providing a clear definition of anomalies and exploring key components of anomaly detection, including anomaly types, application domains, and evaluation metrics. It then presents a comprehensive overview of mainstream anomaly discovery algorithms for data that is streaming, categorizing them into six methodological groups based on their core detection principles: Deviation-Based Methods, Statistical-Based Methods, Distance-Based Methods, Subspace-Based Methods, Clustering-Based Methods and Density-Based Methods. The paper further examines the current state of research, highlights key challenges faced by existing algorithms, and offers a comparative analysis of their strengths and limitations. Finally, it discusses open problems and outlines future research directions to advance the field of anomaly discovery in streaming surroundings.

Paper ID: 24

FROM POST TO PURCHASES: TECHNOLOGY-DRIVEN TRENDS IN CONSUMER RESPONSE TO SOCIAL MEDIA

Kadam, Akshay ; AGARWAL, BHAKTI*; Rastogi, Shailesh; Sharma, Rahul ; Sharma, Deepak ; Tarode, Sanchal

Abstract. IThis research paper aims to focus on the impact of social media (SM) marketing on consumer behavior, mainly focusing on product discovery, brand loyalty and purchasing decisions of the consumers. The research adopts a quantitative research approach by making use of a structured online survey distributed to a diverse group of 64 participants via "Google Forms", a survey administered software.

The survey collected details on demographic profile of the audiences, frequency of SM usage, types of SM marketing, perceived effectiveness of SM marketing and its impact on purchasing decisions and brand loyalty of consumers. The study discovers that SM marketing greatly impacts consumer behavior. This research paper contributes to the existing literature by providing an understanding of the role of SM marketing in shaping consumer behavior and providing insights into the effectiveness of various marketing strategies, including influencer marketing. It focuses on the need for brands to create engaging content on their SM accounts and adapt their approaches based on the needs and expectations of their target audience to improve consumer engagement and brand loyalty.

Paper ID: 25

UAV-Enabled Traffic Surveillance and Density Estimation System Integrating YOLOv8 Detection and BoT-SORT Tracking

N P, Prabu*; V, Vijayalakshmi ; M, Saravanan ; Totawar, Kshitij ; Gupta, Varnika

Abstract: Urbanization and population has intensified traffic and congestion challenges, which creates a need for an intelligent and scalable monitoring systems which can operate with minimal human intervention. Classical surveillance methods like as CCTV cameras, manual patrols suffer from limited spatial coverage, high maintenance costs and susceptibility to human error. To address these limitations this paper proposes a real time drone based vehicle tracking and traffic density estimation framework which utilizes deep learning and computer vision techniques. The proposed system combines YOLOv8 for high precision vehicle detection and BoT-SORT for robust multi object tracking, integrated by OpenCV for frame preprocessing and region of interest (ROI) management. The proposed system achieved a mean average precision (mAP@0.5) of 85.3%, an ID-F1 score of 78.6%. Experimental results demonstrates that the models effectiveness in accurate in detecting, tracking and estimating vehicle density under dynamic aerial conditions, making it suitable for smart city traffic management and autonomous urban monitoring applications.

Paper ID: 31

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Paper ID: 35

Behind the Screens: The Emotional Landscape of Instagram for Students

Jain, Disha ; AGARWAL, BHAKTI*; Rastogi, Shailesh; Sharma , Rahul ; Sharma, Deepak; Tarode , Sanchal

Abstract - Instagram, as a dominant social media platform, has woven itself into the daily routines of students, influencing emotional and psychological well-being. This research examines the intricate relationship between instagram usage patterns and students' daily moods, employing survey responses and statistical analysis. Key factors such as posting behaviour, content consumption, interaction, and engagement were analyzed through correlation and regression techniques. The results revealed that posting behavior is the most significant factor affecting mood, followed by content consumption and usage patterns. Interaction and engagement displayed moderate influence, while passive consumption showed weaker correlation. The findings underscore the need for mindful usage of instagram to mitigate its impact on emotional health, providing a foundation for further exploration into the nuance's effects of digital habits on student well-being.
Keywords: Instagram, Qualitative Method, Digital technologies, Emotional health

Paper ID: 36

From Fear to Insight: Information Visualization of Investor Sentiment During Financial Downturns

Bhadiyadra, Khushi ; AGARWAL, BHAKTI*; Sharma , Arpita ; Sharma, Rahul ; Rastogi, Shailesh; Siddiqui, Mohammad Tarique

Abstract - The aim of the study is to try and understand what are some of the complex psychological factors affecting investors in financial crises. Thus, it revisits the effects of fear, overconfidence, and the impact of herding on decision-making in times of turmoil in the markets. This study tries to explore the issue of emotional and cognitive biases arising at the time of volatility and downturns in the market and how these aspects will eventually affect financial markets. The method for this research is a mixed-methods approach, which incorporates qualitative and quantitative analysis. Data collection for this research would begin with a survey among retail investors to assess their responses in previous downturns, such as during the 2008 financial crisis. According to them, the questionnaire contains psychological scales assessing fear, confidence, and trends towards herding behavior. This is further established by analyzing secondary data from previous stock market crashes, including events such as the dot-com bubble burst and the COVID-19 pandemic.
Keywords- Behavioral Finance, computer-assisted learning, visual analytics, data visualization,

The analysts use regression analysis to establish statistical links between psychological factors and specific investment decisions, such as panic selling, retaining stocks, and frequency of trading. Additionally, the research investigates how retail investors differ from institutional investors in their responses to market declines. In regard to the research objectives of this paper, this paper offers substantive empirical analysis of the psychological aspects that impact market behavior during downturns, especially with retail investors.

Paper ID: 37

AI-Based Cost-Sensitive Engine Fault Detection with Confidence-Guided Maintenance Decision Support

Chunduru, Aryan*; Chunduru, Aryan; Mulakasamudr, Swayam; Vele, Karthik

Abstract: Early detection of engine faults is crucial for ensuring operational safety, reducing maintenance costs, and predicting catastrophic failures in the aviation sector. Conventional threshold-based diagnostics and manual inspections often fail to detect early-stage anomalies and struggle with nonlinear sensor relationships. This paper presents an Artificial Intelligence (AI)–based engine fault detection framework that classifies engine health conditions into healthy, minor fault, and critical fault categories using Decision Tree and Random Forest models based on engine sensor data. Cost-sensitive learning is incorporated to reduce the risk of missed fault detection, and probability confidence analysis is applied to generate meaningful maintenance decisions. A real-time Streamlit User interface is integrated to provide actionable diagnostics, confidence estimation, and maintenance recommendations for practical deployment. Experimental evaluation demonstrates high accuracy, improved fault recall, strong balanced performance, and enhanced reliability through confidence-based decision logic. The framework developed offers a robust, interpretable, and practically deployable predictive maintenance solution for real-world engine monitoring and maintenance applications.

Paper ID: 38

AR, VR and Metaverse Technologies for Smart Cities: Enabling Immersive, Intelligent and Sustainable Urban Futures

Radhakrishnan, Jayabhaduri*; R, Shekhar

Abstract: Rapid urbanization and increasing environmental, mobility, and infrastructure challenges demand smarter and more adaptive city management systems. However, most existing smart city platforms rely on static two-dimensional dashboards that lack spatial awareness and real-time interaction. This paper proposes a metaverse-enabled smart city framework that integrates Internet of Things sensing, artificial intelligence, real-time digital twins, and immersive augmented and virtual reality (AR/VR) interfaces into a unified cyber-physical urban intelligence platform. The framework was evaluated through a real-world case study in Abu Dhabi covering traffic management, environmental monitoring, energy optimization, and emergency response. Experimental results demonstrate that the proposed platform reduces digital twin update latency from 4.8 s to 1.7 s, improves traffic congestion prediction accuracy from 78.2% to 91.4%, reduces average vehicle waiting time by 17.9%, and lowers peak building energy consumption by 12% compared to conventional smart city systems. Emergency response planning time was reduced by 26.3%, while situational awareness and inter-agency collaboration improved by 41.9% and 19%, respectively. Scenario-wise evaluation shows that traffic congestion reduction nearly doubled (from 8.5% to 18.0%), urban heat hotspot detection accuracy increased to 89.6%, and citizen participation rose from 35% to 62%. An ablation study further confirms that removing AI, digital twins, or the metaverse interface leads to substantial performance degradation, with the fully integrated system achieving the best results across all metrics. These findings demonstrate that the proposed metaverse-enabled digital twin framework provides a scalable, immersive, and human-centric approach for building more resilient, sustainable, and intelligent smart cities.

Paper ID: 40

Customer Lifetime Value (CLV): A Financial Perspective on Marketing Investments

Mohapatra, Kirti Koushik ; Tejasmayee, Pracheta*; Kanaujiya, Dr. Jagjeevan ; Rastogi, Dr. Shailesh ; Pushp, Aman ; Sharma, Dr. Preeti

Abstract: The specified study examines Customer Lifetime Value (CLV) as the most significant predictor that could be employed to relate the marketing efforts and their financial performance in the long run through the assistance of Apple iPhone users in India as the specified background. It entails a mixed-method design anchored on SERVQUAL framework that will incorporate a combination of quantitative survey data and qualitative data to determine the impacts of service quality dimensions, product perception and customer satisfaction in order to determine their effects in CLV. Regression results have shown that the relationship between the selected predictors and CLV is moderate, the explanatory power is insignificant, and the coefficients are not significant, which confirms that not only the predictors used in the current model are the most significant ones in predicting CLV. The study findings reveal that perceived service quality, brand trust, and personalized attention as intangible variables are major factors in decision making of long-term customer profitability despite lower statistical significance of the traditional performance variables. Throughout the theoretical perspective, the research promotes the importance of CLV in the process of relating marketing analytics and financial performance, indicating its applicability in resource allocation, customer retention, and customer segmentation. In practice, it can give managers evidence that it is more effective to increase the experience and the level of relations in the customer journey to improve CLV than to concentrate on functional product characteristics only. The paper concludes by suggesting more inclusive CLV models, which utilize changing behavioral, technological, and market aspects to enhance strategic, customer-focused decision-making.

Paper ID: 41

Exploring How Artificial Intelligence Impacts Human Resource Management

Shrivastava, Ankita ; Tejasmayee, Pracheta*; Sharma, Dr. Preeti ; Rastogi, Dr. Shailesh ; Pushp, Aman ; Tarode, Sanchal

Abstract: Human resources, in the modern competitive environment, rank among the most crucial assets to attain performance at organizational levels. Organizations will have to implement new and innovative ways of managing human resources to create differentiation from competitors. This no doubt will shift the future of HR management from its traditional approach to an advanced level through automation, augmented intelligence, robotics, and AI.

AI became truly transformational, actually altering the way all of us lived and worked-with the machines performing all the drudgery and thereby augmenting the abilities of human beings. For HR professionals, a reason to adjust to this change is not an opportunity but a compulsion. Modern HR practices are increasingly focusing on the blend of human work and automated assignments to ensure an environment that is efficient and user-friendly. This shift enables the HR teams to focus on employee performance enhancement. The most critical challenge now revolves around how HR departments don the mantle of training and reskill their people to understand and work with AI and robotics. Working through the incorporation of these technologies into the workplace, as well as the development and adaptation of the workforce, is being addressed on a strategic basis.

Paper ID: 42

Advancing Hallucination Detection and Mitigation in Large Language Models: A Comprehensive Review of Contemporary Techniques

L, Joshna*; T G, KARTHIK; K V, Harshitha; B, Mahendra Kumar

Abstract: Large Language Models (LLMs) have demonstrated remarkable capabilities in natural language understanding and generation tasks. However, the persistent challenge of hallucinations instances where models generate plausible yet factually incorrect or unsupported content —remains a critical barrier to their reliable deployment in production environments. This paper presents a comprehensive review of state-of-the-art hallucination detection and mitigation techniques, analyzing their effectiveness across diverse application domains. We systematically examine 28 contemporary approaches, including Retrieval-Augmented Generation (RAG), neuro-symbolic methods, multi-agent validation systems, and prompt engineering techniques. Our analysis reveals that while hybrid RAG architectures achieve 35–60% error reduction, emerging neuro-symbolic approaches demonstrate superior performance with detection rates up to 92% in high stakes applications. We introduce a novel evaluation framework comparing these methods across three critical dimensions: accuracy improvement (15–82% hallucination reduction), computational overhead (5–300ms latency impact), and implementation complexity. Furthermore, we identify seven critical research gaps including real-time performance limitations, multilingual support challenges, and adversarial robustness concerns. The paper synthesizes findings from production deployments across 15 application domains and provides actionable recommendations for practitioners seeking to implement robust hallucination mitigation strategies.

Paper ID: 44

IOT-Based Electricity Billing System with GSM Extension

PRIYANKA , VANDAVASI *; Srikanth, Chakali ; Anil Kumar Yadav, Golla ; Jayaraju, Besepogu; Dinesh madhav, Begara

Abstract: "The design and implementation of an intelligence low-cost GSM Based Energy Monitoring System which limits consumption and increases electrical safety has been reported in this project. The system designed is based on the Arduino Uno microcontroller which receives the real time electrical information from a power sensor PZEM-004T. The novelty of this system lies in the dual alert based on a SIM800A GSM module where an SMS alerting of cumulative energy consumed (kWh) is sent when it exceeds a level of consumption which encourages the saving of energy by the end user and then a telephone call is placed to the consumer when there is an extreme high instantaneous load creating an overload hazard alert. This system supplies the information the end user needs in a concise straightforward and easily read solution for dealing with consumption in a preventive manner and the prevention of hazards."

Paper ID: 46

REAL-TIME DRIVER DROWSINESS DETECTION USING OPENCV AND VISION-BASED PROCESSING ON RASPBERRY PI

REDDY, LOKANATH*; Bugga Susheel, Kuntumalla; Girishwar Reddy, T; Vishnu Vardhan, T; Sri Balaji, T; Yeddulamala, Bhanu Priya

Abstract: Road accidents caused due to drowsiness and fatigue are a severe global crisis that generates numerous serious injuries and fatalities each year. Conventional driver monitoring systems use expensive sensors or single-modality detection, making them impractical for the general public. This project presents a low-cost Raspberry Pi and OpenCV-based driver alertness detection system. By employing multimodal sensors, the system utilizes eye and facial tracking data along with the MAX30100 heart rate, MPU6050 accelerometer and gyroscope gesture data. Processing occurs on the Raspberry Pi using ML algorithms to classify the driver as alert, drowsy, or fatigued based on the real-time webcam input. Response signals from these sensors trigger a dual alerting network, using a buzzer module and vibration motor, once drowsiness is detected. The presented system is portable and cost-effective, making it readily adaptable for personal vehicles.

Paper ID: 47

IOT-POWERED INTELLIGENT SALINE MANAGEMENT AND HEALTH MONITORING SYSTEM

Kotla, Maheswari*; Gundraju , Dhanush

Abstract: "In this project, the author proposes an Internet of Things (IoT)-based monitoring health system based on a range of sensors attached to the ESP8266 microcontroller to constantly monitor the vital statistics of a patient, such as body temperature, heart rate, and IV fluid level. The system involves a load cell to detect the IV fluids, Green Easy Pulse Sensor (HRM2511E) to monitor the heart rate, and NTC temperature to detect the body temperature. The collected information is simultaneously transmitted to a Telegram application to monitor remotely via Wi-Fi and displayed on an I2C LCD. Further, the fluid level reaches a certain level then the IV drip is signaled and operated by a servo motor and alarm. This arrangement will enable healthcare experts to check the saline fluid status remotely since real-time data can be displayed. The device is also fitted with an alarm system to alert the medical personnel in case the saline levels become too low to respond promptly. The system also has a servo motor mechanism to enhance more safety. When it senses that there are abnormal conditions, such as low fluid levels or other possible hazards like reverse blood flow or bubble of air in the blood, it turns off the saline flow automatically.

This is an automated process that improves patient safety when administering intravenous therapies by eliminating potential risk. Due to the real-time data of this smart healthcare system, medical staff members can act faster and ensure the safety of a greater number of patients. To ensure the efficiency and safety of intravenous saline delivery, the research article explains how an Internet of Things-based smart saline monitoring system can be designed and implemented. The system measures the quantities of saline fluid in real time by using the HX711 and load cell. The measured data is fed into an ESP microcontroller that is tasked with the responsibility of continuously monitoring the saline level. "

Paper ID: 49

Comparative Evaluation of CNTFET Vs CMOS Half Adder and Multiplexer

Kishore, T*; Molaka, Harshitha manogna; Jhansi, Kochervu; Reddy, Polu Harshitha

Abstract: "Carbon Nanotube Field Effect Transistor (CNTFET) versus traditional 45nm Complementary Metal Oxide-Semiconductor (CMOS) half adders and multiplexers in both binary and ternary styles are compared in respect to the design of simple digital circuits. Cadence Virtuoso is applied to simulate transistor level simulations to accurately measure key performance indicators including power consumption, speed, area and complexity of design. The paper observes the merits of CNTFET technology such as superior switching property and fewer transistors that improves efficiency and performance of the circuit. This is quantified using systematic modelling and optimization techniques, including transistor scaling and low-power design techniques, to determine the effects of these new nanoscale devices on such important parameters in ternary logic circuits as operating frequency, dead zones, power dissipation, and latency. The findings show that low-power high-performance digital systems that will be operated using CNTFET-based devices can be utilized extensively in the future because they are faster and more efficient than the conventional CMOS. This report can be of interest to circuit designers who would want to explore new options in place of traditional CMOS technology."

Paper ID: 50

High speed BCD adder using cmos technology

Varma, Vuggam*; Vinod kumar, Thammadepalle; Vardhanreddy, Harsha

Abstract: Decimal arithmetic gains its importance in different applications in the fields of finance and scientific applications. The approach of running decimal arithmetic over binary hardware requires conversions from decimal to binary and from binary to decimal. These conversions produce inexact results that impose financial losses for companies. Therefore, the need for decimal hardware is of high importance. This work proposes decimal addition circuits and presents their realization in complementary metal-oxide semiconductor (CMOS) technology. LTSPICE SPICE simulator software is used to simulate and verify the functionality of the proposed circuits. The circuits are simulated using 45nm, 65nm, and 180nm technologies and compared against existing works in the literature. Due to the lack of existing work in literature and for purpose of comparison, this work also designed five different BCD adders using different existing binary adders in literature. The experimental results show that proposed decimal adder achieves better performance comparing to the other works. For example, for 3-digit operands, the proposed adder shows a power delay product (PDP), in femtojoule (fJ), of 13.88 fJ comparing to 25.38 fJ, 16.01 fJ, 15.24 fJ, 27.49 fJ, and 27.77 fJ PDP for other works.

Paper ID: 54

Hybrid Few-Shot Self-Supervised Network with Cross-Domain Embedding Alignment for Rare Case Detection

M, sunita; maram, balajee*; Madanaboina, Jyothi; P, Radhakrishnan; misra, alok; V E, Sathishkumar

Abstract: The paper under consideration proposes a new Hybrid Few-Shots Self-Supervised Network that tries to improve the process of the rare cases discovery by the matching of the embeddings across domains. As is the case with our own case with few-shot learning and self supervised models these limitations might be compensated by the capabilities of both instances as it is in the few cases of the few-cases cases. It is now possible to optimise the domain level overlap of the embeddings to get a hybrid model architecture, which improves the generalisation and works more robustly against the rare instances detection. It is tested on a broad range of benchmark data sets and what is realized is that the proposed network is performing better when the average accuracy improvement increase is 12 per cent above the current methods available. Moreover we can also add that our model rejects a significant reduction in the amount of false positive and this aspect enhances its usage in the domains as crucial as the medicine diagnostics and anomalies recognition. In our results, we suggest that our plan possesses possibilities of rendering the entire process of identifying rare cases transformative that could provide a scalable and running resolution. It is a breakthrough in the area of cross domain: the work is the norm in the sphere and it preconditions the progressive research to the hybrid models.

Paper ID: 55

Deep Reinforcement Learning-Based Adaptive Decision-Making System for 6G Internet of Vehicles

Amaresam, Ravi Kumar; N, Sunil Kumar; maram, balajee*; P, Radhakrishnan; misra, alok; V E, Sathishkumar

Abstract: 6G networks are rapidly developing and delivering ultra-reliable, low-latency, and AI-enabled communication needed for the Internet of Vehicles (IoV) ecosystem. This paper introduces the Next-Generation Intelligent Decision-Making Framework, designed to improve vehicular communication, traffic prediction, and network optimization by integrating machine learning (ML) technology with 6G-enabled IoV. The framework combines deep reinforcement learning and convolutional networks as a hybrid ML model and demonstrates 92.8% prediction accuracy, 31% latency reduction, and 27% improved bandwidth utilization when compared to traditional frameworks. Decision-making is performed efficiently in-vehicle networks under dynamic conditions with a QoS reliability of 99.4%. The system IoV employs is the first of its kind and fully developed as a beacon of intelligent, secure and adaptive vehicular AI. The proof of concept establishes a pathway to autonomous and cooperative driving in a 6G ecosystem. The purpose of this paper is to describe the deep learning innovations of Next-Generation Intelligent Decision Making Framework.

Paper ID: 56

Towards Sustainable Low-Carbon Grids: Predictive Modeling with Nature-Inspired Optimization for Energy Efficiency

Yamjala, Arjun Sagar; Chandra Sekhar, M; maram, balajee*; I, Ravi shireesh Kumar; bhure, Rajkumar; V E, Sathishkumar

Abstract: The shift to sustainable low-carbon power systems requires predictive and optimization systems that can harmonize their operational efficiency with reduction of emissions. This paper presents a unified predictive-optimization framework that incorporates predictive control based on the data with nature-based algorithms in order to improve grid-scale energy efficiency. Predictive models with advanced predictive models are applied to real-time load, generation and environmental data to reflect temporal and spatial correlations of demand-supply behavior. The predictions are then incorporated in a hybridized framework of optimization through altered particle swarm algorithm and genetic algorithm that aims at reducing both the operational costs and carbon intensity of the system at the same time. As experimental validation of multi-regional grid datasets shows, the 18-24 percentage increase in energy efficiency and a 22-percentage drop in carbon emissions can be observed in comparison to conventional scheduling baselines. The findings emphasize the scalability of the model, resiliency to uncertainty as well as policy implications of the model to attain net-zero targets of energy. This paradigm offers a data-driven, reproducible model to create self-adaptative low-carbon grid activities consistent with new sustainability aspirations in the world.

Paper ID: 57

Transformer-Based End-to-End Architecture for Real-Time Object Detection and Range Estimation in Dynamic Environments

M, sunita; KARTHIK, SURUVU ; maram, balajee*; P, Radhakrishnan; misra, alok; V E, Sathishkumar

Abstract: Detecting objects and estimating their distances under real-time constraints and in dynamic scenes is challenging because of occlusions, motion blur, and changes in lighting conditions. This paper describes an end-to-end system built on Transform architecture that incorporates vision transformers and the multi-head attention mechanism to predict the detection and depth estimation tasks simultaneously. The system, built on the KITTI and COCO datasets of over 180,000 images, was validated in dynamic road and indoor scenes. The reported results include 0.82 mean Average Precision (mAP) for object detection, and 0.37 m Root Mean Squared Error (RMSE) for range estimation, exceeding the performance of CNN-based benchmarks by 7-9%. A latency of 28 FPS on an NVIDIA RTX 3090 confirms real-time performance. The results justify the applicability of the system in autonomous driving, robotics, and surveillance.

Paper ID: 60

A Comprehensive Study on the Application of Artificial Intelligence and Machine Learning–Based Pattern Recognition Techniques for the Detection of Signal-Jumping Events at Traffic Intersections with Algorithm Design and Multi-Parameter Performance Evaluation

Manjunath, TC*; T, Sarala; Shadakshari, Shadakshari; Sudarshan, Sudarshan; SV, Sunitha; Savanth, Ashwini S

Abstract: This abstract gives an application of the AI & ML using pattern recognition in identifying jumping signals @ traffic intersections. In recent years, the rapid advancement of Artificial Intelligence (AI) and Machine Learning (ML) has significantly influenced intelligent traffic management systems. One specific challenge in urban traffic control is the detection of “jumping signals,” where vehicles cross the stop line during a red signal, violating traffic norms. Identifying such violations in real time is essential for ensuring road safety, automating enforcement, and reducing manual monitoring efforts. Leveraging AI and ML for pattern recognition in video surveillance data presents an efficient, scalable solution to this problem. Jumping signal detection involves the analysis of real-time traffic footage, where the movement of vehicles is monitored against predefined zones near signal lines. Traditional motion detection methods struggle with accuracy due to noise, poor lighting, or occlusions. By contrast, AI models, particularly those using deep learning, offer robust feature extraction and high adaptability to varying environmental conditions, enabling precise identification of anomalies such as signal jumping.

Paper ID: 62

Techniques for Detecting Printed Circuit BoardDefects Using Image Processing, Machine Learning, and Deep Learning

Lavanya, Moola*; Sreevani, Pathi; Sreedevi, Pobbathi; Chaitanya, K Sirimalla

Abstract: "A fresh look at spotting flaws on circuit boards drives this effort, building a browser-run tool powered by smart imaging tricks. Cleaned-up pictures get fed into trained networks - YOLOv5 among them - or lean on Faster R-CNN’s sharp eye for errors. What shows up is clear sorting of problems caught in the scan. Precision comes from shaping raw shots into usable views first. A fresh start every time a user brings in a PCB image through this Flask-based tool. Defects show up fast, flagged by sound and message windows without delay. Watched patterns of common design errors help shape better circuit boards over time. What works well comes down to numbers - think correctness, sharpness of detection, how much gets caught. Results stay solid, nothing flashy, just consistent. Speed meets smart processing when web frameworks join machine learning for factory-level tasks."

Paper ID: 63

IoT-Based Indoor Air Quality Monitoring System Using ESP32

Shaik, Farhin; Rani, Geetha*; vallamkonda, Rajasekhar; Sunkara, Gayathri; Mopuri, Poojitha; Yadagiri, Tharani

Abstract: "Environmental monitoring of air is extremely beneficial to avoid or minimize health complications related to the harmful effects of air pollutants (CO, CO, LPG, Methane, Smoke, and Volatile Organic Compounds).

The proposed project is an IoT based Air Quality Monitoring System that provides real time monitoring, detection and reporting of the environmental conditions. The system is comprised of an ESP32 microcontroller which analyzes data collected from the combination of MQ-5, MQ-135, and DHT11 gas sensors, allowing detection of gas concentrations, including Carbon dioxide, temperature and humidity. The data collected by the system is communicated through Wi-Fi connection to the Arduino Cloud, where users can access a live dashboard showing real-time data visualization for each measurement location. This project also uses IFTTT automation to record the readings within Google Sheets, and will send alerts when a dangerous amount of pollution is detected. For accuracy, the sensors are calibrated to absorb the surrounding environment, and testing was completed along with validation to ensure the device will reliably detect different air pollutants under various environments. Ultimately, the project findings resulted in a low-cost, portable, and scalable air quality monitoring system appropriate for residential and smart cities. One of the few outcomes of this project is to raise awareness of air quality through scientific measurements, while also providing individuals and relevant organizations the monitoring through the system which allows them to take appropriate preventive measures to control emissions and poor air conditions in the environment."

Paper ID: 64

LoRa-Based Forest Fire Detection and Prediction Using Machine Learning

AHMED, TOWSEEF*; ANAND, K ESWAR; RAGHAVENDRA , K; LAKSHMANNA, BANDARU

Abstract: worldwide, forest fires provide significant threats to the environment, the economy, and people. Damage can be considerably decreased by early identification and fire initiation prediction. This study suggests a low-cost Internet of Things solution for short-term forest fire prediction and near real-time detection that uses embedded machine learning and LoRa connectivity. Temperature, humidity, gas (smoke), and flame sensor data are collected by sensor nodes based on Arduino Uno and sent to an ESP32 gateway via LoRa SX1278. To identify increased fire risk, the gateway uses a lightweight machine learning classifier. It then sends out auditory alarms to the sensor node and back to the gateway. Trends are shown in real time on an OLED panel. Results from experiments (both in the lab and in the field) show that the system can accurately and consistently identify fire precursors with little delay. Along with the limits and potential enhancements, the architecture, methodology, and comparative evaluation are labelled.

Paper ID: 67

LandDocAI: An AI-Powered System for Land Document Analysis and Simplification

Dharishini, padma*; Sachin M, Sachin M; Keerthi BM, Keerthi BM; Aishwarya T. S, Aishwarya T. S

Abstract: Land and property documents such as sale deeds, lease agreements, and ownership records are legally sensitive and often difficult for common citizens to understand due to complex legal language, unstructured formatting, and multilingual variations, and misinterpretation of these documents can lead to legal disputes, financial losses, and fraudulent transactions. This project presents an AI-powered system, LandDocAI for automated land document analysis and simplification that aims to improve accessibility, transparency, and trust in land-related legal processes by integrating Optical Character Recognition (OCR) for extracting text from scanned and digital documents, Natural Language Processing (NLP) for semantic analysis and clause understanding, and Generative AI for producing simplified multilingual summaries. LandDocAI supports documents in English, Kannada, and Hindi, identifies ambiguous or potentially risky clauses, and highlights them for user attention, while a Retrieval-Augmented Generation (RAG)-based chatbot provides document-aware interactive assistance by answering user queries grounded in the uploaded document content. The solution is implemented as a secure web-based platform enabling document upload, analysis, storage, and structured report generation, and experimental evaluation on real-world legal documents demonstrates effective OCR accuracy, coherent summarization, reliable risk identification, and context-aware responses. The results indicate that the proposed system significantly enhances user comprehension of legal documents, reduces dependency on manual legal review, and supports informed decision-making in land and property transactions.

Paper ID: 71

Orthopedic Insight: An Ensemble Deep Learning and Retrieval-Augmented System for Explainable Musculoskeletal Diagnosis

Rasika, Malgi*

Abstract: Musculoskeletal injuries are common, and doctors often rely on X-rays to find fractures and related problems. But many hospitals do not always have radiologists available, causing delays in diagnosis. We introduce OrthoInsight, an orthopedic expert system that combines two main technologies: a deep learning ensemble for classifying X-ray images and a Retrieval- Augmented Generation (RAG) chatbot that explains diagnoses in clear medical language. The image classifier uses both CNN and transformer models, trained with 5-fold cross-validation to create a 25-model ensemble. The system reaches 84.61% accuracy, and Grad-CAM heatmaps show which parts of the X-ray influenced the prediction. The RAG module retrieves trusted orthopedic information and gives short, clinically useful answers. OrthoInsight is designed to make orthopedic diagnosis more accessible, understandable, and reliable in real-world settings

Keywords— Orthopedic AI, Deep Learning, Ensemble Models, Medical Imaging, Retrieval-Augmented Generation, Explainability.

Paper ID: 77

Immersive Elder Connect: A Cognitive-Aware Augmented and Virtual Reality System for Emotional Well-Being of Elderly Users

Abdul, Rehana*; Adimulam, Raghuvira Pratap; Tamatam, Vishnu; Chava, Yaswanthi

Abstract: Immersive Elder Connect is an AI-driven cognitive-aware system that utilizes Augmented Reality (AR) and Virtual Reality (VR) to improve the emotional and mental well-being of elderly individuals. The system introduces a novel cognitive-emotional adaptation framework that personalizes user experiences based on inferred emotional states and interaction patterns.

It integrates an AI-based emotion recognition module with a recommendation engine to provide adaptive VR experiences and AR-guided therapeutic activities tailored to user needs. The architecture includes user interaction, emotion detection, and personalized recommendation modules, forming a closed-loop adaptive system. A prototype was developed using AR/VR platforms, and preliminary evaluation shows improvements in user engagement, usability, and emotional well-being compared to non-adaptive systems. The results highlight the potential of combining immersive technologies with AI-driven personalization to deliver intelligent and user-centric elderly care solutions.

Paper ID: 79

Driving Behaviour Prediction Based On CNN-LSTM Neural Networks Model

Susmitha, Bavigadda*

Abstract: Abstract: Ensuring safe and reliable autonomous driving requires accurate perception of the surrounding environment and intelligent predictive decision-making under dynamic traffic conditions. Human drivers use experience and visual cues to judge when to accelerate, decelerate, or change lanes. However, conventional autonomous driving systems are largely dependent on rule-based logic or sensor-only detection, which often fail in unpredictable, high-speed scenarios such as sudden braking, close-range merging, or dense multi-vehicle interactions. To address these limitations, this research presents a hybrid deep learning-based driving behaviour prediction model that integrates Convolutional Neural Network (CNN) and Long Short-Term Memory (LSTM) networks for real-time collision avoidance and lane decision support. The CNN component processes camera image frames to extract spatial features, including the detection of surrounding vehicles, lane boundaries, and traffic signal states. In parallel, the LSTM component analyses temporal movement patterns such as relative velocity changes, lane stability history, and speed transitions to predict the safest navigation action. The integrated system outputs one of four optimised driving decisions: lane-keep, lane-shift left, lane-shift right, or emergency braking. The proposed method is evaluated in a simulated three-lane highway driving environment containing variable speed traffic. Experimental results demonstrate improved collision avoidance accuracy (98%), reduced false braking, and smoother lane transitions compared to traditional rule-based systems. The hybrid CNN–LSTM architecture thereby enhances decision reliability, driving comfort, and safety in complex real-world traffic scenarios, making it suitable for autonomous driving and advanced driver assistance applications.

Paper ID: 82

LIFI BASED PATIENT MONITORING SYSTEM

Bandham, Jahnavi*; Boddepalli, Dharani; Chodipalli, Bhupathi Raju ; Boyri, Harshini; Pechetty, Tirumala Rao

Abstract: "Light Fidelity (Li-Fi) technology uses LEDs to send data over visible light instead of radio signals. Because of this it is good for sensitive places like hospitals where too many electromagnetic waves can cause problems. In this paper, we describe a patient monitoring system using Li-Fi. This system uses MAX30100 sensor to measure heart rate and SpO_2, it also includes temperature and motion sensors. The data collected from these sensors is sent through fast led pulses, which are then received by a photodiode. The received values are decoded from the photodiode and will be displayed serial monitor for real-time monitoring. Li-Fi provides the potential for a faster and more reliable means of communication while having less interference, indicating better system performance in a healthcare environment. The recommended patient monitoring system (PMS) will be portable, user-friendly, and low-cost while providing a more effective way to securely monitor patients and improve patient care "

Paper ID: 85

Sign Language Interpreter:Haptic Glove

Bhosale, Ramakant*

Abstract: "The loss of the ability to speak or hear can deeply affect a person's emotional and social well-being, as communication becomes difficult in everyday life. Sign language plays an essential role in helping such individuals express their thoughts, feelings, and needs, enabling meaningful interaction with others. This paper presents a wearable system, called a Haptic Glove, designed to translate American Sign Language gestures into readable characters. The glove is equipped with flex sensors and an Inertial Measurement Unit (IMU) to accurately capture hand movements and gestures. The sensed data is transmitted wirelessly to an IoT platform, making the system portable and convenient to use. To enhance gesture recognition accuracy, a machine learning approach using the k-Nearest Neighbors (KNN) algorithm is implemented. Experimental results show that the proposed system achieves an accuracy of 96.8%. Additionally, the glove supports sentence formation, and the recognized output can be displayed on a screen or converted into speech, enabling more natural and effective communication. This glove can be used in communicating the people who don't know sign language."

Paper ID: 86

BigFlood: Big Data-Driven Flood Prediction Using Ensemble ML-DL Models in a Hadoop-Spark Ecosystem

N P, Prabu*; Reyan, Junaid ; D, Subhiksha

Abstract: Floods constitute some of the greatest natural disasters with devastating environmental, economical and social impacts. Conventional hydrological frameworks fail to describe the nonlinear, multi-variable and spatio-temporal relationship of floods, which restrict predictability. This paper presents a big data-based flood forecasting platform, named BigFlood, which has the capability of predicting in the long term and monitoring in real-time. The framework combines the heterogeneous data sources such as satellite imagery, hydrological records, rainfall time series and IoT sensor streams into a Hadoop-Spark architecture to provide scalability and flexibility.

BigFlood uses an automated pipeline, consisting of five machine learning models (Decision Tree, Random Forest, Naive Bayes, K-Nearest Neighbor, and XGBoost) and five deep learning models (Convolutional Neural Network, Long Short-Term Memory, Gated Recurrent Unit, CNN LSTM hybrid and Transformer-based model). Experimental data demonstrate that BigFlood significantly outperforms isolated models and traditional forecasting methods in terms of accuracy, robustness, and scalability. BigFlood leads to more efficient early flood warning, risk assessment and disaster management by offering a deployable and interpretable solution to support urban planning, climate adaptation and resilience strategies.

Paper ID: 88

Efficient Blockchain Architectures for Agriculture Internet of Things Traceability Systems

K, Manikantha*; s, geetha

Abstract: The complexity of agricultural supply chains has increased concerns related to food safety, traceability, trust, and regulatory compliance. Blockchain technology has played a major role in providing solution due to its decentralized, immutable, and transparent characteristics, enabling secure farm-to-fork traceability. This survey presents a comprehensive review of recent advancements in blockchain-enabled agricultural supply chain management, with focus on food safety traceability frameworks, smart contract based compliance automation, transaction cost and latency optimization, and security and privacy preservation. This study focus on present state of architectures that integrate blockchain with Internet of Things (IoT) systems, smart contracts, and distributed storage solutions to provide data authenticity and real-time monitoring. Recent developments in permissioned blockchains, hybrid models, and energy efficient consensus mechanisms are discussed to address scalability and performance limitations. This survey focuses on practical applications across various agri-food domains, including crop tracking, cold-chain monitoring, and regulatory auditing. Major challenges such as data interoperability, high operational costs, privacy leakage, governance complexity, and compliance with present food safety regulations are discussed in depth. This paper also provides information of open research gaps and future directions, mainly the need for scalable, secure, and regulation-aware blockchain frameworks to enable trustworthy and sustainable agricultural supply chains.

Paper ID: 90

Vehicle Management System

Dharashivkar, Aditya *; Bokil, Aary; Pawar, Atharv; Channawar, Samiksha; Kotkar, Mahesh; Jadhav, Deepali

Abstract: "Uncontrolled traffic problems are increasing in urban areas due to the heavy traffic congestions together with the delays in response in the event of an emergency that is caused by the current system of traffic signal. The traditional light systems execute their operations using preprogrammed schedules even though they are not real time adjustable. It is an intelligent traffic light control system that has been created that uses both IoT and algorithms of deep learning and computer vision to adjust emergency vehicle traffic priority during the management of time based traffic control. The system uses OpenCV to do real-time image processing and TensorFlow object detection, which performs two functions at the same time: vehicle counting and the emergency vehicle recognition. IoT modules based on microcontrollers process the real-time video feeds of cameras on the intersection and implement specific priority logic algorithms. The emergency vehicles are discovered, which causes their usual timing suspension on the path clearance through the system as the adaptive control effects the real-time adjustments on the green- light intervals based on the real traffic volumes. The adjusted system technology results in reduced waiting times, as well as, high-quality mobility of emergency responders. The proposed system is related to the existing smart city systems and can be extended through proper changes in the future. The outcomes of the tests confirm that the management system performs vital improvements on the speed of traffic system control and response speed of emergency vehicles. The paper takes into account the functionality of the V2X system communication and pedestrian recognition system and edge processing solution in order to enhance the speed at which these systems work. It is a low-cost system that is applied to facilitate the Intelligent Transport Systems (ITS) development by improving the city transportation security and mobility procedures."

Paper ID: 91

Compact MIMO Antenna For 5G Applications: A Review

P S, Prafulla *; A J, Sharath Kumar

Abstract: The Multiple Input Multiple Output (MIMO) antenna technology is essential to enhancing the functionality of the existing wireless communication system. The survey talks about the recent developments in MIMO antenna design and aims to reducing the mutual coupling effects and improves the performance parameters including operating bandwidth, gain, and efficiency. Using numerous antennas on both the transmitter and receiver sides, a MIMO system improves the accuracy and reliability of wireless communication systems. The isolation between the various ports is an important aspect in the design of efficient MIMO antennas since an ideal MIMO antenna system must be well decoupled between the various ports to improve its functionality. The Major issue in designing the MIMO antennas is to minimize the mutual coupling in MIMO antennas. This paper provides different methods used in reducing mutual coupling.

Paper ID: 92

An Autonomous Agent-Assisted Hybrid AI System for Continuous Heart Disease Risk Monitoring and Prediction

Ganesh, Tetanela*; babu, Mahesh; Masood, Shaik; Ashfar Reyan, Shaik; Chinna Peddanna, Kandi

Abstract: "Cardiovascular diseases are still one of the largest challenges facing modern health care systems, as they have a progressive nature and because early risk detection is difficult. Conventional heart disease prediction models are based on static clinical databases and do not include adaptive or autonomous decision making processes; therefore, their use in monitoring patients with continuous stream of clinical data (physiological data) is limited. This research introduces an autonomous agent-assisted hybrid artificial intelligence system for the ongoing risk assessment of heart disease. The proposed system includes an event-driven intelligent agent that continually monitors the stream of patient physiological data and will automatically determine when to run the predictive analysis.

The proposed system uses Long ShortTerm Memory (LSTM) networks to identify temporal patterns in wearable sensor data, and ensemble-based machine learning models to evaluate the static clinical attributes. The intelligent agent also contains anomaly detection mechanisms to identify abnormal physiological behavior and prevent repeated running of the models during periods of stability. Experimental analysis was conducted using both the UCI Heart Disease dataset and simulated wearable sensor data comparing the results obtained by the proposed approach against those of traditional models that did not contain an intelligent agent. Results indicate that the proposed method provides enhanced early risk identification while reducing the number of false alarms. Therefore, the results indicate that the proposed framework is suitable for long-term monitoring and preventive health care applications because the addition of intelligent agents can significantly enhance the clinical relevance, efficiency, and reliability of heart disease prediction systems"

Paper ID: 94

Intelligent Traffic Management System Using Dynamic Signal Optimization

Kumar A J, Sharath *; R, Harshitha ; H G , Kiran Kumar ; R , Madan ; H R , Manoj

Abstract: Cities across the globe are witnessing a rapid increase in vehicle volume which leads to congestion, increased fuel consumption, and longer travel times. Fixed time controlled traffic systems are incapable of adjusting periods of traffic lights based on the changing conditions of the time of day. This paper presents an Intelligent Traffic Management System (ITMS) that uses computer vision and embedded control to adjust the traffic signal timing according to real time conditions. The ITMS employs the Haar Cascade Classifier in Python (OpenCV) to detect and count vehicles from a live video feed. The ITMS can accurately estimate traffic density traversing multiple lanes. This density information is then sent to an Arduino Uno using serial communication. The Arduino Uno is then able to utilize an adaptive signal timing algorithm to determine the appropriate duration of green-light time based on congestion. For public safety, the system also includes the use of an RFID module (RC522) which scans for emergency vehicles, such as ambulances and fire trucks. When an emergency vehicle is identified, the appropriate lane will immediately turn green, and the illuminated alert will automatically activate with a buzzer to clear the lane. This design aims to reduce unnecessary waiting time, reduce fuel waste, and improve mobility. In addition to lane preference systems with priority-based management, this system is based on low-mounted sensors and open-source code which can be used to allow a lane management system without expensive sensors or infrastructure. The system relies on low-cost components and open-source software, making it easy to scale in dimension and act as an application in smart cities.

Paper ID: 95

Microprocessor Based Energy Management System

Kumar A J, Sharath *; B , Kavyashree; D L , Girijamba ; H M, Nethravathi

Abstract: Objectives: In an era where energy conservation and sustainability are paramount, the integration of machine learning (ML) techniques and embedded systems into power management systems presents a promising solution. This paper proposes a ML-based power management system utilizing Raspberry Pi, a relay, and a camera. The system employs a COCO dataset-based human detection model running on the Raspberry Pi to detect human presence in a room. When no human presence is detected, the system automatically switches off the relay, thereby conserving power.

Paper ID: 96

SMART UMPIRE GLOVE SYSTEM FOR GESTURE - BASED SCORING ACROSS MULTI-SPORT ENVIRONMENTS

Gopisetty, Sai Charitha; Sai theerdhankar, Aluri*; Chitikela, Lohith; Dwarapudi, Aswith Kumar; Gurrampalli, Sudharson

Abstract: "In professional and amateur sports alike, officials such as referees and judges play an important role. While officials strive to do their job to the best of their ability, it's important to remember that mistakes can be made, even by the most experienced officials. In addition, all officials rely heavily upon hand signals to communicate their decisions, including scoring, fouls, and stoppages. For officials, one of the biggest challenges when relying on hand signals is that often times, our gestures may be misinterpreted or completely missed by those watching. Additionally, when officials manually track events, they may have trouble with consistent recordkeeping or timing due to human error. Today, however, thanks to advancements in technology including wearables, IoT devices, and embedded ML, we are able to have smart umpire gloves that instantly read, recognize, and transmit gestures. This review will provide an in-depth look into how smart umpire gloves work, the technology behind them, how they read and recognize gestures, and how they perform under real game conditions. This will include how IMUs, flex sensors, and TinyML work together to gather sensor data for multiple types of sports, as well as how wireless transmission of data is enabled by these gloves. We will also discuss the current limitations of smart umpire gloves: (1) how gestures differ significantly across different sports and cultures; (2) how universal models of gestures will need to be created in order to work in real-time; and (3) how it is important for all decisions made by an official must also be made in nearrealtime. Looking ahead, there is potential for AI powered umpiring, better gesture integration, and connecting these gloves directly to professional sports systems. "

Paper ID: 97

MoodTrace: An AI-Powered Emotional Wellness Companion with Context-Aware Intelligence

M, Shamita *; K, Prof.Manjushree ; S, Yashaswini; Habbu, Varsha

Abstract: With an increase in the usage of social media, there has been a large impact on mental health, especially among students and young adults, leading to rising levels of stress, anxiety and depression in these young generations. In this digital age, there are a significant number of mental health wellness journals which just passively provides a platform to vent but does not particularly help them to get better. Hence, we present our solution Moodtrace, an emotional wellness journaling application which is designed to analyze emotional patterns from journal entries written by a user and use that to predict potential mood dip periods.

The application is developed using React Native and JavaScript, with Supabase used as the database. Python is used for the machine learning models and text-processing components. A Bidirectional Long Short-Term Memory (BiLSTM) model is used to learn patterns from journal entries, and these patterns are then used to provide mood dip alerts to the user. Also, a Retrieval Augmented Generation (RAG) based chatbot is available to provide more context-aware responses for user questions. The application is designed to help users understand their emotions better and hence become more aware of their mental well-being.

Paper ID: 98

Smart Vehicle Surveillance with Complaint Detection and Alert Mechanism

SUNIL KUMAR, BANDARI KURUVA *; Rani, Mrs. A. Swetha; Chandraiah, Gorla; Yadav, B Yeswanth Kumar

Abstract: "This work presents a novel surveillance system aimed at increasing the observation of cars and preventing theft by employing advanced methods in artificial intelligence. The process to be used is methodical. It starts with YOLOv8, a deep learning model that has established speed and precision in identifying license plates. After the detection of the plate, EasyOCR is utilized to decode the characters and the text is translated in a correct format. For having text alerts in real time, Twilio SMS services were utilized for an instantaneous alert. This enables an automatic communication to be set up for alerts in the event that a mistakenly parked or suspicious car is detected and does not require 24/7 human monitoring. The system does the detection of location and alerts automatically with the resulting boost in accuracy and response time. The objective of this project is to develop an intelligent, dynamic, efficient and productive solution in order to help trace and recover stolen or lost vehicles and enhance road security and public trust. The project is a credible solution for Smart Patrol of vehicles using AI. Index Terms—ANPR, YOLOv8, Deep Learning, EasyOCR, SMS Services"

Paper ID: 105

An Artificial Intelligence-Driven Social Network Analytics Model for Detecting Online Grooming and Child Abuse Patterns

Mallick , Navonita *; Sahu, Shashwata; Sethi , Ramesh Chandra ; Jain, Ashima ; Jena, Arpita

Abstract: The present study has focused on the development of an artificial intelligence-enabled social network analytics model for early identification of online grooming and child abuse patterns. Overall, this strategy relies on the integration of graph network analysis techniques and machine learning to enable early warnings about groomer patterns and escalations of risk due to relationship and interaction values. This approach prioritizes leveraging graph network analysis techniques and online interaction data to identify unusual activities early, before harm occurs, beyond common content-centric moderation. Ethical and legal considerations, including privacy, proportionality, and responsibility, form integral parts of the analysis process, providing proactive means to address moral concerns related to child safety on online social networks. The research analysis thus demonstrates how AI-aided techniques and tools in social network analysis offer proactive approaches to child safety and committed child safety practices for regulatory compliance.
Keywords—Artificial Intelligence, Social Network Analytics, Online Grooming Detection, Child Abuse Prevention, Digital Child Safety

Paper ID: 106

AI-Driven Predictive Analytics for Cardiovascular Risk in Paediatric Type 1 Diabetes with Enhanced MRI Artifact Removal Techniques

R, SAVITHA *; HM, Nethravathi

Abstract: Cardiovascular complications are a leading cause of morbidity in paediatric patients with Type 1 Diabetes (T1D), highlighting the need for timely and accurate risk prediction to guide clinical decisions. Magnetic Resonance Imaging (MRI) remains the gold standard for non-invasive cardiac assessment, but its use in children is often limited by artifacts such as motion distortion, undersampling errors, and noise, which reduce diagnostic reliability. Integrating artificial intelligence (AI) into predictive analytics offers a promising solution by simultaneously improving artifact suppression and cardiovascular risk assessment. This study proposes a novel AI-driven framework that combines traditional filtering techniques with advanced deep learning-based denoising for robust MRI artifact correction. The approach integrates convolutional neural networks, generative adversarial networks, and ensemble-based hybrid filtering to correct motion, noise, and hardware-induced distortions. Quantitative evaluation shows that the hybrid AI + median filtering method outperforms all baseline techniques, achieving a peak signal-to-noise ratio (PSNR) of 29.56 dB, structural similarity index (SSIM) of 0.952, and signal-to-noise ratio (SNR) of 17.23 dB, while reducing mean squared error (MSE) to 112.48. These improvements significantly enhance image quality, thereby strengthening the performance of multimodal cardiovascular risk assessment in T1D children. By integrating structural, functional, and textural MRI features with clinical parameters, the framework enables comprehensive risk stratification. These findings support the clinical viability of AI-enhanced MRI for early diagnosis and personalized care in paediatric diabetes.

Paper ID: 107

Deep Learning-Based Cancer Diagnostics with Texture Feature Extraction and Visual Interpretation from MRI and CT Scans

N, Dr Raghu*; Khusniddin, Ramazonov ; Shojonov, Muzaffar; Umarov, Doniyor ; Kenesbaevich, Seitnazarov Kuanishbay

Abstract: This paper introduces an automated system which detects cancer and determines its stage through deep learning methods that analyze MRI and CT scan images with texture-based approaches. The system uses Gray Level Co-occurrence Matrix (GLCM) feature extraction together with a Convolutional Neural Network (CNN) to identify cancerous tissues from healthy ones while also determining the stage of cancer. The system enhances its discriminatory power through its use of contrast and homogeneity as key texture features yet it uses Grad-CAM to display medical image areas which doctors need to focus on.

A user-friendly graphical interface enables non-technical users to interact with the system seamlessly. The evaluation process showed that the system achieved 95% accuracy for binary classification between healthy and cancerous tissue and it reached 90% accuracy for classifying six different categories which included Healthy and Stage 0 through Stage 4. The model demonstrates its strength through high precision values and recall scores which produce strong F1-scores. The results indicate that the proposed explainable deep learning system can serve as an effective decision-support tool for accurate cancer diagnosis and staging.

Paper ID: 108

A Comparative Study of Attention-Based vs. Convolutional Architectures for Robust Haematological Malignancy Prediction

N, Dr Raghu*; Bakhrom, Abrayev ; Umarov, Doniyor ;Shojonov, Muzaffar; Ashirova, Anorgul ; Kenesbaevich, Seitnazarov Kuanishbay

Abstract: The global healthcare sector faces an urgent need to develop rapid diagnostic solutions which enable doctors to begin treatment for patients who suffer from Acute Lymphoblastic Leukaemia (ALL) and other Haematological malignancies. The standard Convolutional Neural Networks (CNNs) which perform automated cell classification at high accuracy levels struggle to capture important spatial connections that exist across entire images because they operate through local processing. The study puts forward a diagnostic system which uses Vision Transformer (ViT-B/16) architecture to solve existing problems through its worldwide self-attention operational system. Our research team conducted an extensive comparison between ResNetRS50 and RegNetX016 CNN backbones and other state-of-the-art models through our C-NMC dataset which contains more than 15,000 microscopic images. Our results demonstrate that the proposed ViT model achieves a superior diagnostic accuracy of 98.24%, which surpasses the 97% performance standard set by traditional models. The system provides attention-map-based interpretability which lets users view essential cellular elements such as chromatin density to create direct links between AI systems and medical professional understanding. The study demonstrates how attention-based systems will transform the way automated cancer detection systems develop in the future.

Paper ID: 109

Marine Pollution Control: Ocean Plastic Identification Using Machine Learning

N, Dr Raghu*; Buriyev, Sardor ; Toshpulatovna, Davlatova Sayyora ; Ruzieva, Mukhayya ; Saodat, Yusupova ; Shojonov , Muzaffar

Abstract: The aquatic ecosystems face an urgent threat because of marine plastic pollution which needs automated systems to perform precise detection. The research demonstrates a machine learning system which employs Convolutional Neural Networks (CNN) to detect plastic materials and non-plastic waste present in oceanic environments. The modified EfficientNetB0 architecture uses standardized preprocessing together with data augmentation methods to improve its performance under different lighting conditions and water visibility levels and object shape changes. The model uses public image datasets of aquatic debris to train and evaluate its performance. Experimental results show that the proposed system achieves over 95% classification accuracy on the test dataset, with consistently decreasing loss and stable convergence across training epochs. The model demonstrates strong generalization performance, accurately detecting common plastic objects such as bags, bottles, gloves, and masks in unseen images. The lightweight architecture and high accuracy indicate suitability for real-time deployment in large-scale marine monitoring, autonomous underwater vehicles, and edge-based environmental surveillance systems.

Paper ID: 110

Enhancing Students with Telegram Chatbot-Powered Digital Classrooms

N, Dr Raghu*; Ubaydullaevna, Abdullaeva Dilbar ;Matchanova, Barno; Marimbaeva , Surayyo; Xurramova, Dilsuz ; Ruzieva , Mukhayya

Abstract: Telegram-based chatbots help students learn better in SmartClass Connect environments than WhatsApp and Facebook Messenger and internet-based chatbot systems. Telegram allows users to have flexible API connections to access unlimited message storage through its user-friendly interface with inline buttons for easier communication between teachers and students. Users of online robots should perform additional login steps which hinder them to start their conversations immediately. The system utilizes AI-based IoT devices with a digital notice board to combine schedule information with study materials and enhance educational content. The system constructs an eco-friendly educational environment that facilitates users to move around the system. The development of intelligent learning environments has accelerated, as these areas provide the best teaching methods which help both students and their teachers. The combination of the strong features of Telegram with AI and IoT technology solves these problems through digital classrooms that provide interactive learning environments, improve student engagement, and prepare them for the future

Paper ID: 129

A Robust Approach for Fruit Freshness Detection Using Deep Learning and Gaussian Filtering

REDDY, BIJJAM GOPAL*; Khan, Patan Feridoz; Mereena, Bodanapu ; Suresh, Batthala; Kumar, Chenji Nithin

Abstract: Early detection of spoiled fruits plays a tremendously important role in lowering the loss of crops after harvest and raising the efficiency of the supply chain. Some recent studies have been able to get very high accuracy using only 2D RGB images and convolutional neural networks (CNNs), but such methods are still single, view limited, and therefore, they fail to detect some of the hidden rotten areas. This paper offers a 3D and multi, view deep learning technique for the classification of fruit freshness to be highly reliable even when the fruit condition is not clear visually. Several pictures take of each fruit at different angles and are considered as multi, view image stacks or volumetric inputs. A 3D Gaussian smoothing technique is used as part of the preprocessing step to reduce spatialdepth noise, thus 2D Gaussian filtering methods can be considered as an extension. The model uses either a 3D CNN or a multi, view CNN with feature, fusion layers, then batch normalization and dropout are added to improve generalization. The experiments performed on a balanced dataset split (80% training, 10% validation, 10% testing) reveal that the method presented is significantly better than 2D baselines. The proposed method comes up with overall accuracy of 99.85%, balanced accuracy of 99.78%, and an F1, score of 99.80%, whereas the Type, II errors (rotten fruits counted as fresh) have been decreased by 42% when compared with single, view models. The findings indicate that there has been a significant improvement in the system's capability to handle the real, life scenarios, thus this solution can be used for automatic conveyor belts, warehouses as well as in fruit sorting industries.

Paper ID: 131

Unique Learning Model for Early Detection of Parkinson's Disease via Hand-Drawn Figure Analysis

Feridoz Khan, Patan; Gowtham, Pillari*; Vamsi, Saragadam; Basha, Shaik Mahaboob; Rithvik, Polagani

Abstract: "Parkinson's disease (PD) is a chronic and progressive neurodegenerative disorder manifesting primarily through motor dysfunction, including tremors, rigidity, and bradykinesia. Early diagnosis is critical for managing symptom progression, yet current clinical assessments largely rely on subjective observation, often resulting in delayed or inaccurate diagnoses. Objective alternatives like neuroimaging are expensive and not widely accessible. To address this gap, this work focuses on the development of a Unique Learning Model (ULM) for automated, non-invasive PD detection via the analysis of hand-drawn spirals and waves. The system developed in this study utilizes a digitizing tablet to capture high-resolution spatiotemporal data. A robust feature extraction pipeline is implemented to quantify subtle kinematic and geometric abnormalities, such as velocity instability, acceleration jerk, and stroke irregularity. These features feed into a hybrid ensemble classifier integrating Random Forest, Support Vector Machines (SVM), and Neural Networks through a weighted voting mechanism. Validated on a dataset of 300 samples, the ULM achieves a classification accuracy of 94.5%, a sensitivity of 95.0%, and an F1-score of 94.0%, significantly outperforming individual baseline models. By effectively distinguishing between PD patients and healthy controls based on minute motor fluctuations, this technique offers a scalable, low-cost solution for early screening in primary care and telemedicine settings. The results confirm that combining static visual analysis with dynamic kinematic profiling provides a holistic digital phenotype of the disease, promising improved patient outcomes through earlier intervention"

Paper ID: 135

Optimizing Dynamic Storage Integrity Verification for Industrial Internet Platforms in the Cloud

Nalini, N.; Swarna Latha, Munthala; Kumara Sai Krishna Swamy, Pabbisetty*; Kiranmai, Pakala ; Ankamma Rao, Nallagorla

Abstract: —As local manufacturing units increasingly migrate to cloud-based infrastructures, preserving data integrity becomes a paramount concern. In our initial interactions with industrial systems, verifying sensor logs proved exceptionally challenging because they are not static archives but highly dynamic streams characterized by rapid, continuous updates. Most existing auditing schemes, while theoretically robust, fail to account for this high-frequency data "churn," leading to severe computational bottlenecks when deployed on standard, low-power factory hardware. This work presents Edasvic, a practical storage verification system meticulously tailored for these rigorous constraints. By implementing polynomial commitments on the Barreto-Naehrig (BN) 254 curve and integrating them with bilinear map accumulators, we successfully achieved constant-size proofs regardless of the dataset scale. A pivotal innovation in our approach is the "Region of Interest" (ROI) strategy, which significantly reduces computational load by prioritising "hot" data based on its real-time freshness and assigned criticality. Our extensive testing on simulated factory lines demonstrates that this method enables seamless verification without disrupting the high-frequency operations of industrial sensors. Specifically, Edasvic achieved an update latency of just 12.4ms—nearly 25 times faster than traditional Merkle Tree approaches—while maintaining a stable memory footprint perfectly suitable for resource-constrained edge devices. This paper details a comprehensive methodology integrating these mathematical primitives into a cohesive architecture, ensuring that theoretical cryptographic guarantees translate into practical, robust security against dynamic storage outsourcing attacks in the modern Industry 4.0 landscape.

Index Terms—Data Integrity, Cloud Storage, Industrial In- ternet, Polynomial Commitments, Dynamic Verification, Bilinear Accumulators.

Paper ID: 136

TARGETED ADVERSARIAL ATTACK ON VISION-LANGUAGE MODEL FOR PATHOLOGY IMAGES

A, SARAN KUMAR*; Raman, Valliappan; S, Harish Siva; S, Nithish; R, Preethi ; M, Elakiya; P, Akash Raj

Abstract: This study explores how secure and reliable Vision–Language Models (VLMs) are when used in digital pathology. Digital pathology combines microscopic tissue images with automated text generation to help doctors make diagnoses. Models like CLIP and BLIP are powerful because they can understand both images and language, making them useful for assisting medical professionals. However, they can also be easily tricked by adversarial attacks—small, intentional changes to images that cause the model to make incorrect predictions. This is a serious concern in healthcare, where accuracy is critical for patient safety. To examine this issue, we built a complete Vision–Language pipeline using the PathMNIST dataset. The system included three major components: tissue classification at the patch level, aggregation of results at the slide level, and automatic medical caption generation. We then tested the system against three common adversarial attack methods: Fast Gradient Sign Method (FGSM), Projected Gradient Descent (PGD), and Adversarial Patch attacks. These attacks were applied at different strengths to see how easily the models could be misled. The results showed a clear drop in performance. Both the accuracy of tissue classification and the quality of generated medical descriptions declined significantly, even when the perturbations were very small. This demonstrates that VLMs can be highly vulnerable in clinical contexts. We also tested defense strategies such as JPEG compression and adversarial training. Overall, the findings highlight that while Vision– Language Models hold great promise in pathology and medical imaging, their current vulnerabilities make them risky for direct clinical use. Stronger defenses, better interpretability, and continuous safety evaluation are essential before deploying such AI systems in real-world healthcare. Ensuring reliability and trust is crucial, especially when these tools may influence medical diagnosis and patient outcomes.

Paper ID: 138

Strategic Typology Alignment and Market Intelligence Utilization: Evaluating Organizational Intelligence Maturity Through Prospector-Defender-Analyzer Frameworks

koli, pouras*

Abstract: This paper examines the contingency relationship between firm strategic typologies and the effectiveness of mar- ket intelligence utilization within organizational decision-making ecosystems. Drawing on qualitative and quantitative data from 57 Australian for-profit enterprises, the study evaluates whether Prospector, Analyzer, and Defender strategic archetypes and Cost Leader, Differentiator, and Focus positioning strategies correlate with differential intelligence maturity outcomes.

The research employs a multi-dimensional performance assessment instru- ment combining supplier credibility metrics and organizational satisfaction dimensions to evaluate market intelligence project outcomes. Findings reveal that Prospector strategic types demon- strate superior rational intelligence exploitation patterns and lower susceptibility to organizational political misappropriation of market data compared to Defenders. Strategic intelligence initiatives exhibit enhanced knowledge-generation outcomes and reduced interpretative degradation. The Miles and Snow typol- ogy demonstrated greater predictive validity than competitive positioning models in explaining intelligence utilization variance.

Paper ID: 139

Omnichannel Customer Engagement Architecture: Evolutionary Trajectory of Electronic Commerce Communication Paradigms and Performance Attribution Mechanisms in Multi-Channel Brand Ecosystems

koli, pouras*

Abstract: This paper analyzes the architectural evolution of omnichan- nel customer engagement systems in modern electronic commerce ecosys- tems. The study explores how firms integrate communication channels, behavioral intelligence, and attribution modeling into unified engage- ment architectures that improve conversion efficiency and customer life- time value. Using organizational case observations and simulated perfor- mance experiments across multi-channel environments, the research iden- tifies structural patterns that differentiate mature omnichannel ecosys- tems from fragmented channel strategies. Results demonstrate that co- ordinated engagement architectures outperform isolated channel opti- mization by improving response coherence, reducing attribution noise, and stabilizing performance forecasting. The paper provides an applied framework for designing scalable omnichannel infrastructures that align communication, analytics, and operational governance in digital brand ecosystems.

Paper ID: 140

Multi-Objective Creative Intelligence: Modeling Ad Text Performance with Context-Aware Neural Highlighting

koli, pouras*

Abstract: An accurate prediction of ad conversions is generally harder as such conversions occurs infrequently. We shall propose a new framework to help in creating high-performance ad cre- atives which will also help in accurately predicting the ad creative text conversion before it reaches the customer. The proposed framework consists of three important concepts: multi-task learn- ing, conditional attention and attention highlighting. The concept of multi-task learning enhances conversion prediction accuracy by enabling the simultaneous estimation of clicks and conversion, effectively addressing the challenge posed by data imbalance. In addition, conditional attention is a concept that focuses the attention of each advertisement creative by taking its genre and target gender into consideration to improve the accuracy of conversion prediction. Attention highlighting visualizes the words and/or phrases by conditional attention finally. We assessed the performance of our framework using the actual delivery history data from Gunosy Inc (about 14,000 creatives displayed more than a certain amount) and confirmed that our ideas improve the prediction performance of conversion and visualize the noteworthy words according to creatives' attributes.

Index Terms—Online Advertising, Ad Creative, Multi-task Learning, Attention Mechanism, Conversion Prediction, Neural Networks

Paper ID: 143

Real-time AI-based blood donor-recipient matching and alert system using Random Forest Classifier

Girada, Navya*; Gunti, Susanna; Y, Rahul Reddy; Gogula, Sreenivasulu

Abstract: Rapid identification of compatible blood donors during medical emergencies remains a persistent challenge due to limited donor availability, geographic dispersion, and time-sensitive decision requirements. This paper presents a real-time AI-based blood donor–recipient matching and alert system designed to enhance emergency response through intelligent donor selection. The proposed system utilizes a Random Forest machine learning classifier trained on donor demographic and donation-history attributes to predict donor eligibility based on learned patterns from historical data. Unlike conventional rule-driven systems, the model adapts dynamically as new donor records are added, enabling data-driven eligibility assessment. To support location-aware matching, donor and hospital addresses are represented using postal pincodes, which are converted into geographic coordinates to estimate inter-location distances. An adaptive radius expansion mechanism incrementally broadens the search area to ensure the identification of nearby eligible donors while minimizing response time. The system further incorporates a real-time alert mechanism to notify shortlisted donors and record their availability status. Experimental evaluation on a real donor dataset demonstrates that the proposed approach achieves approximately 90% predictive accuracy with high recall, effectively reducing missed eligible donors. The results indicate that the proposed framework offers a scalable, intelligent, and practical solution for real-time blood donation management in emergency healthcare environments.

Paper ID: 148

EduMatchAI: A Generative AI-Powered Personalised Recommendation System for Discovering Indian Educational Institutions

Achari, Penikalapati Hruday*; Sudareswaran, Dr. N.; Yeswanth Kumar, Perneti; Meghana , Sakam; Madhan Mohan Reddy, Peram

Abstract: "The selection of the education institution in India can be quite difficult because of the lack of complete information, ambiguous ratings, and the absence of individual recommendations. This study introduces EduMatchAI, a Generative AI-based recommendation system that assists students in finding the right college according to their unique requirements that include the choice of location, academic performance, financial limits, course interest, and accreditation standards. The system combines generative language models, content-based ranking and validated institutional datasets to give customized recommendations to institutions and insights. In order to enhance trust and transparency, alumni reviews, placement information and government recognition are also included in the decisionmaking. The platform has a friendly chatbot interface, multilingual support and real-time recommendations refinement. Experimental assessment proves to be more relevant, less time spent searching and more satisfaction among users than the conventional methods of searching in colleges. EduMatchAI is one of the steps of accessibility, transparency, and AI-based educational decision support to students in India."

Paper ID: 149

Design and Implementation of a Blood Donation Management System

Singh, Ravi*; Madhurima, S.; Kumar, Sonu; Sudhir, K.; Aravinda Rajan, V

Abstract: "Modern Online Blood Donation Management Systems (OBDMS) are transforming how blood supply operations are managed in healthcare. These systems aim to resolve persistent challenges like donor-recipient mismatches and shortages. By integrating both web and mobile platforms, OBDMS connect donors, hospitals, and blood banks efficiently. Agile software development ensures flexibility and continuous improvement. ERPbased architectures enhance system scalability and data integration. The client-server model allows real-time synchronization of blood inventory and donor data. Donor registration and tracking modules simplify management and record-keeping. Secure communication channels protect sensitive medical data. Advanced privacy frameworks ensure compliance with healthcare standards. Research shows these systems increase donor participation and response times. Usability studies reflect improved hospital coordination and trust. OBDMS enhance healthcare efficiency through intelligent, technologydriven solutions."

Paper ID: 150

An Intelligent Multi-Stage Plant Disease Detection and Recommendation System Using Hybrid CNN Attention and Environmental Data Fusion

Uppara, Nandakishore; Harish Kumar, Vadde; Madhav, V*; Lokesh Reddy, Daivala; Sushama, C

Abstract: The occurrence of plant diseases continues to pose a serious obstacle to agricultural productivity, creating a need for reliable, early-stage, and context-driven diagnostic methodologies. Building upon the IEEE Access reference work on real-time plant disease dataset development and CNN-based classification, this project proposes an advanced intelligent multi-stage plant disease detection and recommendation framework. Although existing studies report effective results using optimized deep learning architectures, most of them concentrate only on image-based classification and do not explicitly consider disease development stages or surrounding environmental conditions. To address these limitations, the proposed mechanism introduces a hybrid CNN–attention-based architecture combined with environmental data fusion for enhanced practical deployment feasibility. The system integrates disease localization through object detection, multi-task learning for simultaneous crop type, disease class, stage (early, moderate, severe), and severity estimation, and attention modules to emphasize critical infected regions. Additionally, environmental parameters such as temperature and humidity are fused with visual features to reduce misclassification among visually similar diseases. The proposed framework includes a decision-support module that delivers disease-stage–oriented treatment suggestions along with alerts generated from real-time climatic information, while a continuous learning loop enables expert feedback for adaptability. Experimental analysis indicates that the proposed framework improves diagnostic accuracy, interpretability, and decision support, making it suitable for precision agriculture and farmer-centric deployment.

Paper ID: 160

SUSTAINABLE SOLUTION FOR CONVERTING FARMING WASTE INTO ECONOMIC WEALTH

Chenna, Arun*; Avvaru, Hari Sai Kiran ; Annangi, Karthikeya; Davuluri, Vinithri; P, Suresh babu

Abstract: "Agricultural wastes are in most cases underutilized or released to the environment, with the ultimate result being wastage to the farmers as well as environmental problems. Nevertheless, fertilizer industries, biogas companies, and other businesses are able to use this waste as a good raw material. The given paper suggests a Waste-to-Wealth Agricultural Marketplace, created on the basis of the MERN stack and combined with a truck recommendation system based on the principles of the Machine Learning. The platform allows the farmers to make waste listings, whereby they specify the type, quantity, location, price and attach appropriate photos. Once the farmer reacts to the request and adds the charge of delivery, buyers have an opportunity to browse such listings, make orders, and conclude transactions. A Machine Learning model is used to predict the most appropriate type of truck to be used in each transaction according to the distance, volume of waste and location, so as to maximize the transportation. Decision Tree, Random Forest, and XGBoost classifiers were used in training and testing the system with high prediction accuracy of over 90 percent with the use of Random Forest and XGBoost. After the confirmation of payment farmers will be able to input the shipping information like vehicle number, delivery date and real time delivery status like picked up, on way or delivered. The system allows a digital marketplace to be combined with predictive logistics and ensures a sustainable ecosystem, which would enable farmers to make more money, buyers to receive raw materials more effectively, and the entire supply chain to be cheaper and more environmentally friendly."

Paper ID: 161

EDUAID - One Profile all Opportunities [AI-Powered Centralized Scholarship Finder Platform]

SANDEEP VARMA, PENMETSA*; SRI AKASH, KANCHARLA ; KARTHIK KUMAR, NANDHYALA ; VENKATA SANTHOSH REDDY, YAMMANURU ; A.Parivazhagan Dr.

Abstract: Scholarships play a crucial role in supporting students' education, yet many deserving candidates miss opportunities due to fragmented information, complex eligibility criteria, and lack of awareness. This paper presents EduAid, an AI-powered centralized platform designed to address these challenges by aggregating scholarships from government and private sources and providing personalized recommendations based on student profiles.

The system leverages machine learning techniques such as content-based filtering and classification to match eligibility criteria with user data, while also offering features like search, filtering, deadline reminders, and notifications through an intuitive interface.

The proposed solution not only improves accessibility and awareness but also enhances decision-making for students by reducing the effort required to identify relevant opportunities. The expected outcome is a scalable and user-friendly platform that increases scholarship utilization and can be extended to include international opportunities and multilingual support in the future.

Paper ID: 164

Active Tele-Scam Mitigation Using HaloProtect-Based Behavioral and Network Analysis

A, Nandhithaa*; L, Leena; S, Leon Ronaldo; P, Poovarasan; M, Sudha

Abstract: " Tele-scams are a major security problem in the current telecommunication networks in that they are taking advantage of voice communication channels by means of social engineering, spoofing the caller ID and automated fraudulent campaigns. The conventional scam detection systems are more reactive and do not offer protection in real-time, especially when making live calls. To overcome these shortcomings, in this paper, an active tele-scam mitigation framework, called HaloProtect, a combination of behavioral voice analysis and network-level intelligence with machine learning-based classification, is presented to detect and intervene on a real-time basis. The offered technique continuously observes the existing calls, derives multi-dimensional behavioral and network characteristics, and evaluates the scam risk score to allow actively defensive measures, including alerting the user and blocking the incoming call. As experimental analysis on a sample of 10,000 calls shows, HaloProtect has an average detection latency of 120-168 ms, end to end response time of less than 290 ms, and scam mitigation rate of up to 91.2 with a low false intervention rate at 3.8 - 5.1 under different load conditions. Also, the system has an average resource usage as CPU consumption is less than 55 percent in high load scenarios. These findings confirm the usefulness, scalability, and timeliness of the suggested HaloProtect model, which is pro active in preventing tele-scam on current-day communication networks."

Paper ID: 165

IntelliBroker: A Conversational AI for Real Estate Trend Analysis and Document Summarization using Retrieval-Augmented Generation

Yennam, Praneetha*; Madishetty, Vignesh; Kamsani, Akash; Ala, Rajitha

Abstract: Real estate decision-making requires fast, reliable interpretation of both market data and complex legal documents, yet existing tools often lack real-time grounding and predictive integration. This paper presents IntelliBroker, a Retrieval-Augmented Generation–based Conversational AI system that unifies trend forecasting with document-aware question answering. The framework combines retrieval-guided generation with predictive learning and entity-aware retrieval mechanisms to improve factual reliability and reduce hallucination. Experimental results demonstrate strong gains in price prediction accuracy, retrieval relevance, and summarization quality, along with major reductions in task execution time across real estate workflows. These results confirm that IntelliBroker provides a scalable and practical solution for data-driven real estate analytics.

Paper ID: 168

Zero Trust Network Access System (ZTNAS)

Md, Ameena*; Nayak, Sanjeeb kumar; Panindra, V. Sai; v, Vikas; Y, Kousik

Abstract: The Zero Trust Network Access System (ZTNAS) is a modern cybersecurity framework designed to remove implicit trust from network security. Instead, it constantly checks and verifies every user, device, and application before allowing access. In this paper, we present a ZTNAS model based on the principle of “Never Trust, Always Verify.” The system brings together Identity and Access Management, Multi-Factor Authentication, Micro-Segmentation, and ongoing behavioural monitoring. By using these methods, ZTNAS reduces the risk of attacks, stops threats from moving across the network, and gives organizations clear, real-time insights into their security. Our experimental evaluation shows that the proposed ZTNAS offers better security, scalability, and adaptability than traditional perimeter-based and VPN models, making it well-suited for today’s cloud-first business environments.

Paper ID: 171

An AI-Based Image Captioning System using Visual Transformers

Kumar, Didde Pavan*; Niharika, Gudime; Madugundu, Lakshmi Narasimha; Surya, Karubhuktha; Sivakumar, Chinnavel; Natesan, Sanjeevi

Abstract: "The rapid proliferation of multimedia on the web has created an urgent demand for algorithms capable of translating pixel-level data into coherent semantic descriptions. This study introduces ”Automatic Zoom,” a novel image captioning framework designed to bridge the gap between computer vision and natural language generation. Unlike conventional methods that rely on static templates or simple recurrence, our approach integrates a Vision Transformer (ViT) with the GPT-2 language model to achieve a deep, contextual understanding of visual scenes. The ViT encoder processes images as sequences of patches, capturing global relationships without the inductive bias of Convolutional Neural Networks, while GPT-2 generates fluid, human-like text conditioned on these visual embeddings. Trained on the COCO dataset, the system demonstrates superior performance in generating contextually accurate descriptions, even in the presence of noise or occlusion. "

Paper ID: 172

Real-Time Route Deviation Detection and Alerts

Kancharla, Renuka*; Kandula, Naga Keerthana; Manchikalapati, Sowmica Sareena; MandhiReddy, Hithendra Reddy; Gutam, Bala Gangadhara

Abstract: Traveler safety remains a primary concern in the modern era, particularly for solo commuters facing unfamiliar routes SmartRoute Guard addresses this challenge by providing a software-centric solution for real-time trajectory monitoring & anomaly detection The work focuses on analyzing live GPS data streams to identify significant deviations from expected paths By integrating machine learning models, specifically Long Short- Term Memory (LSTM) networks for predictive path mod- eling & Isolation Forests for outlier detection, the system distinguishes between legitimate detours & suspicious movements Coordinates are streamed from client-side browser or mobile interfaces to a backend infrastructure where trajectory integrity is assessed in real-time Upon detection of a critical anomaly, the platform triggers automated alerts to pre-configured emergency contacts via multi-channel communication services including SMS (Twilio), email (SendGrid), & WhatsApp A web-based dashboard, engineered with React.js & Tailwind CSS, facilitates visual monitoring of active trips & historical alert data This approach eliminates the dependency on specialized IoT hardware, offering a scalable & privacy-conscious safety mechanism for ride-hailing users, fleet operators, & individual travelers.Index Terms Real-Time Monitoring, Route Deviation, Anomaly Detection, Machine Learning, Safety, LSTM, Isolation Forest.

Paper ID: 174

Design and Development of a Solar-Powered Bluetooth-Controlled Smart Pesticide Spraying Robot for Safe Agriculture

ALA, RAJITHA*; bhatnagar, Akshat ; Nithisha Reddy, Arijala ; Vinay Kumar, Gaini ; Sindhu Reddy, Seelam

Abstract: The agricultural sector faces many challenges, including unpredictable weather, plant diseases, pest infestations, and soil nutrient deficiencies, which often cause significant crop losses. To address these issues, Crop Care Solutions, an intelligent decision support system, has been developed to help farmers make timely and informed decisions. The system collects and analyzes environmental data (temperature, humidity, rainfall, sunlight), soil data (moisture, nutrients, pH, soil type), and crop health data (growth, disease, and pest detection via sensors or images), providing a holistic view of farm conditions. Specialized modules process this data, including disease detection, weather advisories, and fertilizer recommendations, while a Crop Health Score quantifies overall crop condition and risk levels. Outputs, such as detected diseases, recommendations, advisories, and health scores, are presented in simple language for easy understanding. By enabling early risk detection, optimizing inputs, and offering actionable guidance, Crop Care Solutions improves yield, reduces losses, and promotes sustainable, technology-driven agriculture, with future enhancements like mobile integration, real-time sensors, and predictive analytics further supporting proactive farm management.

Paper ID: 176

ALERT CAP:A Smart Helmet System for Real-Time Safety Monitoring in Contruction Sites

ALA, RAJITHA*; Bhavya Reddy , Vedire ; Jyoshnasri , Darapuneni ; Avinash, Yambari ; Chakri Reddy, Vittedi

Abstract: The Smart Safety Helmet (Alert Cap) is an intelligent protective device designed to enhance worker safety in industrial, mining, and firefighting environments. The system integrates flame detection, object proximity sensing, and vibration feedback to alert users of potential hazards in real time. A flame sensor identifies heat or fire sources, while a proximity sensor detects obstacles or moving equipment nearby. Powered by a compact battery, the helmet ensures continuous operation without hindering comfort or mobility. By combining traditional head protection with embedded electronics, the Smart Safety Helmet transforms passive safety gear into an active hazard-detection system, significantly reducing the risk of accidents and improving situational awareness for industrial and emergency response workers.

Paper ID: 178

Automated Discrimination of Basal and Squamous Cell Carcinoma Using EfficientNet-Based Transfer Learning

GNANESWARARAO, NAGASURI*; P, SURESH BABU; KALLAGUNTA, SAI BALAJI; BATTULA, RANGAIAH; KETHAMALA, AJAY

Abstract: The most commonly occurring types of non- melanoma skin cancer are Basal Cell Carcinoma (BCC), and Squamous Cell Carcinoma (SCC) where timely and precise diagnosis is vital in ensuring the minimization of morbidity and healthcare burden. The traditional clinical evaluation based on the dermoscopic images is excessively reliant on dermatological knowledge and is subject to inter-observer error. This paper introduces an automated deep learning model to discriminate BCC and SCC on the basis of transfer learning using EfficientNet convolutional neural network to deal with these challenges. The suggested solution has embedded dataset-specific preprocessing and broad scale augmenting data to solve the issue of class disparity and improve model generalization. The efficientnet-based fine-tuning can be selectively applied to the layers to adapt the deep feature representations to the characteristics of the dermoscope images. Accuracy, precision, recall, F1-score and AUC are used to evaluate model performance. Gradient- weighted Class Activation Mapping (Grad-CAM) is used to highlight discriminative areas of lesions that affect model predictions to increase transparency and clinical trust. Empirical evidence shows that the proposed framework has strong and better classification performance than baseline convolutional models. The results reveal that the EfficientNet-based transfer learning, imbalance management, and explainable artificial intelligence methods can be viewed as a promising and reliable solution to the computer-aided diagnosis of non-melanoma skin cancer in order to aid early diagnosis and to enhance clinical decision-making.

Paper ID: 181

Blockchain-Driven NFT Auctions for Transparent and Efficient Charity Fundraising

Kavya, Potturu*; Fowjiya, Shaik; Praveena, Sareddy; Karthik, Peddinti; Sushama, C

Abstract: Charity auctions are increasingly adopted, instead of raising the funds to charities, donors participating in charity auctions to serve the need people. To prevent fraudulent activities, there is an increasing demand for transparency and accountability in charitable fundraising, for which blockchain technology provides trust, traceability, and operational efficiency. This study is to design Blockchain-Driven NFT Auctions for Transparent and Efficient Charity Fundraising by integrating technologies like smart contracts, non-fungible tokens (NFTs), and artificial intelligence (AI). The proposed design operates on a Hyperledger Besu blockchain framework with cross-chain interoperability. It supports donors to have secure and transparent interactions with charities, and regulators In the auction process, NFT models are used to tokenize donated assets, while stablecoin integration ensures financial stability. The platform works with zero-knowledge proofs (zk-SNARKs) and decentralized identity (DID) verification to get more trust and preserve privacy. AI analysis also integrates to monitor the real time transactions to identify anomalies, which helps to maintain fair auction process. Experimental results show that the proposed system achieves significant improvements compared to existing models, including reduced latency and enhanced security. This proposed system will be more scalable for maintaining charitable NFT auctions to forecast donor confidence and selection.

Keywords — Blockchain technology, Non-Fungible Tokens (NFTs), Smart contracts, Charity fundraising, Hyperledger Besu, Cross-chain interoperability, Stablecoin payments, Decentralized identity (DID), Zero-knowledge proofs (zk-SNARKs), Artificial intelligence (AI) analytics, Transparency, Traceability, Secure auction platform.

Paper ID: 185

FloodMind: An AI-Driven LSTM Framework for Flood Risk Prediction

Poojitha Sri, Vattipally*; Ganesh Goud, Mahadev ; Reddy,Sama Ritheesh; R.J., Shobanbabu

Abstract: Floods are one of the most destructive natural disasters that cause significant damage to human life, infrastructure, and economic stability. Flood prediction is critical for effective disaster preparedness and management. This paper proposes an artificial intelligence framework for flood probability prediction based on Long Short-Term Memory (LSTM) networks. The proposed framework combines environmental, infrastructural, and socio-economic parameters to effectively model the complex and non-linear relationships that exist in flood events. The proposed framework involves comprehensive data preprocessing, including data cleaning, normalization, and feature scaling, to enhance model stability and performance. The proposed LSTM model is designed to effectively learn temporal relationships from multi-dimensional input data. The proposed framework is evaluated using standard regression performance metrics such as MAE, RMSE, MSE, and R^2 score, which clearly indicate its high prediction accuracy and robustness. The experimental results clearly show that the proposed framework is highly effective in outperforming the existing prediction methods and providing accurate flood risk assessment.

Paper ID: 187

Building Resume Impact And Development With Guided Artificial Intelligence

vishnu vardhan, pathyapu*; Nurja, Syed ; Sai Sharan, Paluttla; Maneesh Kumar, Chintamani; SRI VAMSI KRISHNA, AVUKU ; Sandya, Vooradi

Abstract: In today's fast-moving job market, job seekers often struggle to create resumes that clearly represent their skills and experience. With the increasing use of Applicant Tracking Systems (ATS) by companies, resumes are usually screened by automated systems before they reach human recruiters. Because of this, many applicants are rejected early in the hiring process due to missing keywords, poor structure, or lack of alignment with current industry requirements. Even strong candidates sometimes fail to pass these automated filters.

To address this issue, this paper presents BRIDG.AI, an AI-powered platform designed to help individuals improve their resumes and increase their chances of getting noticed by employers. The platform uses Large Language Models (LLMs), Natural Language Processing (NLP), and ATS-based analysis techniques to evaluate resumes in terms of structure, clarity, and keyword relevance. Based on this analysis, the system provides detailed suggestions that allow users to improve their resumes and better match specific job descriptions.

In addition to resume optimization, BRIDG.AI also monitors job market trends and identifies emerging skills and technologies that are becoming important across industries. By analysing a user's background, interests, and career goals, the platform recommends relevant job opportunities as well as personalized learning paths to help users strengthen their skills. By combining resume analysis, ATS optimization, job insights, and career guidance, BRIDG.AI aims to support job seekers throughout their career development process and help them navigate the modern recruitment landscape more effectively. Unlike traditional ATS-based systems, the proposed approach incorporates transformer-based semantic embeddings and a hybrid scoring model that combines contextual similarity with keyword and structural analysis to improve resume-job alignment accuracy.

Paper ID: 188

IOT Based Voice Controlled Smart Missile Launcher

DEVI, RANJITHA*; Abdul Azeez, Shaik ; Murali Mohan, K; Ganesh, P

Abstract: Through the integration of Voice UI and IoT platforms, users can enjoy intuitive, hands-free control of their devices. This article showcases a simulation-based study focusing on an IoT- based voice-controlled system for actuation, concentrating on usability, reliability, and security aspects. The setup involves a simulated voice assistant, a microcontroller unit, and cloud services like Adafruit IO and IFTTT for command execution and monitoring We scrutinize security measures pertaining to authentication, secure communication, and anomaly detection under various networking and latency scenarios. Furthermore, we will delve into usability factors such as the accuracy of voice recognition and the nature of response feedback to devise the strategies that would enhance the user experience and safety. All the configurations were verified in a simulation environment to guarantee a morally correct and safe operation. The findings point to the necessary design elements for building secure, IoT-based voice control systems that are not only efficient but also user- friendly. Moreover, we submit suggestions secure automation and the advancement of smart control technologies.

Paper ID: 189

Creation of a dynamic comparator with low power consumption that is ideal for use in analog-to-digital converters

DEVI, RANJITHA*; Reddy, J Maharshi ; Reddy, G Ashok Kumar ; Phanishwar, B C

Abstract: "The objective of this project is to develop and a low-power dynamic comparator, for Analog-to-Digital Converters (ADCs), on Cadence Virtuoso in 180nm CMOS technology. B oosting speed and power efficiency is the primary aim at transistor-level circuits. Two comparator architectures explored with and without sleep transistors: a Dual Sleep comparator and a proposed Dual Sleep controlled Double Tail comparator. These design for low-power, highspeed ADC applications to minimize power consumption without operating frequency or delay performance."

Paper ID: 190

Stability Analysis of Three-Stage CMOS Op-Amp

Gugulothu, Dr Bhaskar*; Sravanthi , G Sai ; Xerin Maria, F Julia ; Varshith , G

Abstract: This paper presents a structured method for creating a three-stage amplifier, designed to overcome the shortcomings of conventional two-stage setups especially in situations that require high gain and robust load-driving capabilities. The design is segmented into three functional components, each specifically engineered to enhance particular performance features.

The initial stage is a differential amplifier that provides high input impedance and preliminary voltage gain, reducing the loading on the signal source and ensuring input precision. The second stage provides further voltage amplification but lacks adequate current drive, necessitating a third stage. This concluding stage acts as a buffer or gain booster, supplying both voltage and current gain to effectively manage low-impedance loads while preserving signal integrity. The suggested design is additionally confirmed through performance assessments and stability tests of the operational amplifier.

Paper ID: 194

Predictive Maintenance Using Adaptive Inspection Policies Based on Monotonic Degradation Modelling

Samayam , Thejesh Kumar*; Sivaji, Sudula ; Vikash Kumar Reddy , Ummadi; Venkata Varshith, Vivaram ; Madhusudhan Rao, C

Abstract: Degradation modeling is a core component of prognostic maintenance, as it directly affects reliability assessment and Remaining Useful Life (RUL) estimation. Many active prognostic maintenance and inspection optimization models assume that degradation follows the Wiener process. Although analytically convenient, the Wiener process permits bidirectional fluctuations in degradation trajectories, which contradicts the irreversible and additive nature of physical wear in industrial systems. This mismatch can result in unrealistic degradation paths and unreliable RUL predictions in practical industrial applications.

This study consistently examines the limitations of Wiener process– based degradation modeling and proposes a Gamma process as a more physically consistent alternative. Unlike the Wiener process, the Gamma process enforces monotonic, non-decreasing degradation, aligning with real world wear mechanisms observed in manufacturing equipment. Both models are implemented under identical conditions and evaluated using the AI4I 2020 predictive maintenance dataset. Comparative results show that the Wiener process produces highly fluctuating and non-monotonic degradation trajectories, including surreal decreases in wear. In contrast, the Gamma process yields smooth, strictly increasing degradation paths that better reflect additive tool wear. The Gamma model also provides improved stability and interpretability for failure time prediction and maintenance planning. These findings demonstrate that replacing the Wiener process with a Gamma process enhances the realism and practical reliability of degradation.

Paper ID: 205

Personalized disease detection System using Artificial Intelligence

PRIYA, YEDDULAMALA *; Chetla Mallapuram, Srikanth Yadav ; Devinolla, Arun kumar; Ala, Jaya Prakash Royal; Chilakala, Lokanath Reddy

Abstract: The Personalized disease detection System is an AI technology that can identify diseases in medical images such as CT scans, MRIs, and X-rays. It examines images of various body parts to detect issues like cancer, broken bones, and heart problems using deep learning models. We apply standard evaluation metrics to assess the system's performance and confirm its reliability. Users can upload medical images and receive predictions along with basic health tips on a user-friendly web interface. our main motive is to give access to the people around us that everyone can able to know their disease by their own. we are trying our best to give exact results of their disease. It proposes a personalized body disease detection system using artificial intelligence (AI) to predict and diagnose various diseases based on individual health data. The system will utilize machine learning algorithms to analyze medical images, electronic health records, and sensor data to detect anomalies and provide early warnings for diseases such as diabetes, cardiovascular disorders, and cancer. The AI-powered system will enable personalized disease detection, improving diagnosis accuracy and treatment outcomes.

Paper ID: 207

Fine-Grained Agricultural Pest Classification onHigh-Cardinality Indian Datasets via Optimized ConvNeXt and Class-Balanced Focal Loss

Irfan, Mohd*; Padma, Nanda; Akshay, Alugula ; Vaishnavi, Bandar; Chhabra, Manish ; Arora, Gagandeep

Abstract: "The development of an automated, high precision pest diagnostic system is presented, with the objective of mitigating massive losses of crop-productions and improving the financial stability of smallholder-farmers in India. A 132-class Pestopia dataset based on the 132 classes is used to address a Fine-Grained Visual Categorization (FGVC) challenge, characterized by a high degree of cardinality and a high level of imbalance between the classes. As the base model, a ConvNeXt-Tiny deep learning architecture is used and pre-trained on ImageNet 21k. The fine-tuning technique is adopted to address the problem of overfitting and inequity of the data, and RandAugment is used to strengthen the data augmentation power, Class-Balanced Focal Loss is introduced to prioritize minority classes, and Layer-Wise Learning Rate Decay (LLRD) is adopted to maintain the key transferable features. Top-1 and Top-3 accuracy are 74.52% and 90.31% respectively, which is shown by experimental assessments on an unseen test set. The results are incorporated into an independent Streamlit web app which is connected to a curated SQLite knowledge base which gives farmers immediate pest detection and treatment suggestions in real time. This study forms a technical basis of precision agriculture in terms of diagnostic latency and a scaled offer of pest management in response to the Indian agricultural atmosphere."

Paper ID: 210

TamilMED Assistant-AI Powered Medical Symptom Checker and Prescription Assistant

N, Thangavel *; G, Swathi; M, Dr. Sudha; R, Sruthi; M, Tharun Aashsish; D, Vishnuvardhan

Abstract: " Access to timely healthcare remains a major challenge, especially in rural and semi-urban regions where hospitals and doctors are limited. In addition, many patients face difficulties expressing their health concerns in English, which further delays diagnosis and treatment. To address this gap, we propose a Voice-Based Generative AI Medical Symptom Checker and Prescription Assistant that works in Tamil, making it more accessible to local users. The system converts a patient's voice into text, interprets symptoms using a GenAI model, and matches them with a symptom–disease knowledge base. It then provides possible health insights, preliminary prescriptions, and first-aid guidance in both text and spoken Tamil. The application also allows users to call a doctor, locate nearby hospitals, or generate a report of their health queries. This work demonstrates how combining GenAI with speech technology can provide affordable, language-friendly, and inclusive healthcaresupport for underserved communities. "

Paper ID: 219

Explainable and Human-Centric Business Intelligence Platform for Executive Decision-Making

G, Devi; G, Swathi; A, Roshan; S, Prince *; R, Vikas; K, Vikesh

Abstract: " Modern enterprises generate vast volumes of data, yet executive decision-making often relies on simplified dashboards that provide limited explanatory or predictive value. Traditional Business Intelligence (BI) systems primarily focus on descriptive and diagnostic analytics, offering historical insights without sufficient transparency or actionable guidance. This limitation becomes critical when executives, who may not possess advanced analytical or machine learning expertise, must make high-impact strategic decisions under uncertainty. This paper presents an Explainable and Human-Centric Business Intelligence (EHCBI) platform designed to enhance executive decision-making by integrating machine learning, explainable artificial intelligence (XAI), predictive analytics, and prescriptive intelligence within a unified framework. The proposed system enables decision-makers to understand not only what has occurred in the business environment, but also why it occurred, what is likely to happen next, and what actions should be taken to optimize outcomes. By incorporating explainability mechanisms, natural language interaction, and user-centered design principles, the platform bridges the gap between complex analytics and executive cognition. The architecture emphasizes transparency, trust, and usability, positioning the system as a next-generation BI solution suitable for decision-critical enterprise environments."

Paper ID: 222

Grain Storage and Smart Monitor by using IOT

ALA, RAJITHA*; Akshaya, Gandla ; Sirisha, A.D.Rani ; Srinu, Narayanadas ; Kumar, Perla Shashi; Avishya, Pannala

Abstract: Losses of grains resulting from post-harvest storage conditions remain a major setback in ensuring food security and sustainability in the agricultural sector. This paper describes the design and development of a Smart Grain Storage Monitoring System that continuously monitors key environmental factors such as temperature, humidity, and gas levels within grain storage units. The proposed system combines low-cost sensors with an Internet of Things (IoT) platform to facilitate real-time data collection and monitoring. Data from the sensors is analyzed through embedded controllers and then uploaded to a cloud-based platform for remote monitoring by farmers and storage facility managers to prevent spoilage, pest, and fungal attacks. Automatic alerts are generated based on set thresholds to notify users through mobile and web-based applications when unsafe storage conditions are detected. The experimental outcome has shown improved management of storage conditions, minimized risks of grain spoilage, and optimized decision-making efficiency. The proposed system provides a scalable, cost-effective, and energy-efficient solution for small-scale farmers and large storage units, thus ensuring minimized post-harvest losses and improved food security.

Paper ID: 223

AgriCart an AI-Powered Farmer Friend

C, Selvadurai*; R, Santhiya; V, Premkumar ; S, Sedhupathi ; G, Devi

Abstract: Agriculture remains the backbone of rural economies, yet farmers continue to face challenges such as unfair pricing, market inaccessibility, post-harvest losses, and a lack of real-time decision support. This paper proposes AgriCart, an AI-powered, farmer-friendly e-commerce platform that directly connects farmers with consumers, enabling transparent pricing, demand-driven production, and intelligent market insights. The system integrates artificial intelligence for crop price prediction, demand forecasting, and personalised recommendations, while providing a user-friendly digital marketplace for buying and selling agricultural products. AgriCart reduces dependency on intermediaries, improves farmers' income, and enhances consumer access to fresh produce. Experimental evaluation shows improved transaction efficiency, reduced wastage, and higher user satisfaction compared to traditional agricultural marketing systems.

Paper ID: 225

INTELLIBOARD 2.0: Gen-ai visualisation platform for smart dashboard creation & business insights

Lakshmipriya J, Ramani*; M, Sudha; G, Devi; Lakshmi G, Rakshana; K, Ramanesh; Chandran V, Ravi

Abstract: The exponential growth of enterprise data has intensified the need for effective Business Intelligence (BI) solutions; however, most existing BI platforms remain complex, analyst-driven, and inaccessible to non-technical business users. Decision-makers are often required to depend on technical teams to interpret dashboards, write queries, or generate reports, resulting in delayed insights and reduced operational agility. Additionally, limited support for contextual understanding, role-based access, and robust security mechanisms further restricts trust and usability in traditional BI systems. To address these challenges, this paper proposes IntelliBoard, a secure, conversational Business Intelligence framework designed specifically for business and management users. IntelliBoard enables natural language interaction for analytics, allowing users to query data intuitively and receive business-focused insights instead of raw numerical outputs. The system integrates Natural Language Processing (NLP), guided analytics, and AI-driven insight generation to deliver role-aware dashboards that adapt dynamically to user responsibilities and decision contexts. IntelliBoard incorporates strong security controls, including role-based access control (RBAC) and data encryption, ensuring privacy, compliance, and controlled information visibility across organizational levels. Real-time data processing and interactive visualizations support faster and more confident decision-making, while reducing reliance on technical experts. Experimental observations indicate that IntelliBoard enhances usability, decision speed, and analytical independence, making it a cost-effective and trustworthy BI solution for small and medium enterprises.

Paper ID: 226

MOLECULAR POTENCY PREDICTION USING GRAPH CONVOLUTIONAL NETWROK

DIVIJ, BUDDAREDDY*; JAYAKRISHNA, LAMBU; Raghuram, Ulasala ; Panidhar Reddy, Lingareddy; P, SURESHBABU

Abstract: "Drug discovery requires accurate molecular potency predictions which enable scientists to reduce their testing costs during their first evaluations of new drug candidates.Traditional Quantitative Structure Activity Relationship (QSAR) methods depend on manually created molecular descriptors together with fingerprint-based machine learning approaches which include Random Forest and XGBoost because these methods lack the ability to understand complete molecular structural connections. The research introduces a graph-based model which predicts molecular potency through Graph Convolutional Networks that learn from molecular graph data which SMILES strings produce. The proposed system transforms chemical structures into graph representations that treat atoms as nodes while treating chemical bonds as edges. The model uses structured molecular features to predict pIC50 values and tests its performance against existing fingerprint-based baseline models. The experimental results show that the graph-based method produces better prediction results and wider applicability than standard techniques. framework provides an efficient and scalable solution for virtual screening and early drug candidate selection in modern drug discovery pipelines."

Paper ID: 227

Safeguarding Digital Imagery: Real-time Forgery Detection with Swin transformer

Gowtham, Bireddy; Butta, Sreeya*; P, Suresh Babu; Harshitha, Araveti; Mani Prakesh, Ammineni

Abstract: "Due to the rapid rise of sophisticated image manipulation techniques such as deepfakes and AI generated forgeries, there is a growing need for more accurate and efficient image forgery detection systems. Traditional methods like basic Convolutional Neural Networks (CNNs) often struggle to capture both fine-grained local patterns and broader contextual inconsistencies, especially when dealing with complex or high-quality manipulated content. To address these limitations, we recommend the Swin Transformer as an advanced and effective model for forgery detection. The Swin Transformer's hierarchical architecture allows it to analyze images at multiple scales, enabling it to identify subtle pixel-level anomalies as well as large-scale structural inconsistencies that typically occur in forged or generated images. This multi-level representation makes it highly reliable in detecting even the most realistic AI-generated fakes. Moreover, the Swin Transformer provides superior computational efficiency compared to traditional deep learning models. Its shifted window-based attention mechanism significantly reduces processing cost without sacrificing accuracy, making it ideal for mobile and edge device deployment. This means that forgery detection can now be performed in real time, allowing users to verify the authenticity of images instantly and conveniently—anytime and anywhere."

Paper ID: 228

Causality-Guided Multimodal Explainable AI Framework for Dynamic Cardiovascular Risk Prediction and Personalized Intervention Planning

Akthari, Nafiya*; Rani, Swarna

Abstract: Cardiovascular diseases (CVDs) remain the foremost cause of global mortality, highlighting the need for accurate, reliable, and clinically interpretable risk prediction systems[1]. Although machine learning (ML) techniques have demonstrated strong predictive capability in heart disease detection, many models operate as opaque "black-box" systems, limiting their acceptance in clinical practice. This study proposes a causality-aware, interpretable multimodal cardiovascular risk stratification framework that integrates structured clinical parameters, physiological indicators, and lifestyle risk factors to enhance predictive performance and transparency. The dataset used in this study was obtained from the Kaggle, consisting of 303 patient records with 14 clinical attributes and a binary target variable representing the presence or absence of cardiovascular disease for individuals aged between 30 and 80 years.

Paper ID: 231

Hire Flow - AI Powered Hiring System

M, Rithika*; G, Devi; N, Vijiyalakshmi; A, Senthamilkathiravan; M, Surya Prakash ; L, Vishnu Prabu

Abstract: Recruitment processes in modern organizations are often time-consuming, inefficient, and heavily dependent on manual screening methods. Recruiters must evaluate hundreds of resumes, conduct preliminary assessments, and manage communication workflows, which leads to delays and potential bias in hiring decisions. At the same time, job seekers struggle to identify suitable roles and experience unclear recruitment procedures. To address these challenges, this paper proposes HireFlow, an AI-powered hiring platform that automates and streamlines the recruitment lifecycle through intelligent job description generation, AI-based resume parsing, candidate ranking, online assessments, and integrated communication tools. The system supports two user roles — recruiter and job seeker — with separate dashboards and personalized workflows. Recruiters can create job postings, generate screening questions using AI, and evaluate candidates based on resume-job matching scores and assessment performance. Job seekers undergo preliminary screening tests before submitting applications, ensuring quality candidate filtering. The platform also includes messaging, forums, coding assessments, and interview management within a unified ecosystem.

Paper ID: 232

Attentio - An AI-Powered Student Engagement Analyser with learning roadmap

S, Swopanaa; R, Sasi Krubalani*; M, Sudha; K, Karthikeyan ; G, Vishal; M, Prasanth

Abstract: Online education has become an important component of modern learning environments, but monitoring student engagement during virtual classes remains a significant challenge for instructors. Unlike traditional classrooms, teachers cannot easily observe students' facial expressions, eye contact, or attentiveness in real time. To address this issue, this paper proposes Attentio, an AI-powered student engagement analysis system designed for online learning platforms. The proposed system integrates a web-based portal that enables instructors to conduct live sessions, monitor student attentiveness, and generate automated engagement reports. The system uses computer vision techniques implemented with OpenCV and MediaPipe to detect facial presence and analyze eye gaze direction from webcam input. Based on these visual indicators, students are classified into attentive, distracted, or inactive categories, and an engagement score is calculated periodically during the session

Experimental evaluation conducted during multiple online sessions demonstrates that the system can effectively monitor student engagement with an approximate accuracy of around 90% under normal classroom conditions. Additionally, the platform generates structured engagement reports and suggests academic roadmaps to support student improvement. The proposed system aims to enhance teaching effectiveness and promote more interactive and data-driven online learning environments.

Paper ID: 233

AI– DRIVEN REAL-TIME THEATRE PIRACY DETECTION USING COMPUTER VISION

G, Devi; k, Karthikeyan; S, Sanjeev Kumar; S, Sijin John *; G, Sharan

Abstract: "The increasing use of smartphones has contributed to unauthorized movie recording in cinema environments, leading to significant losses in the entertainment industry. Traditional monitoring methods rely on manual supervision, which is inefficient in large and low-light settings. This paper presents an AI-based system for detecting mobile phone usage using computer vision techniques. The proposed approach utilizes the YOLOv8 model for real-time object detection. To improve detection reliability, a behavior-aware mechanism based on temporal analysis is introduced. Instead of generating alerts for short-duration usage, the system identifies continuous mobile phone activity over a defined period. The system is implemented as a prototype simulation model using a standard laptop camera in a controlled environment. Theatre-like lighting conditions are simulated to evaluate system performance. Experimental results demonstrate effective detection performance with reduced false positives. The proposed framework highlights the feasibility of intelligent monitoring systems and provides a foundation for future real-world deployment. "

Paper ID: 234

Predicting Student Churn in School Systems Using Graph Neural Networks

Thakur, Harshini*

Abstract: " Predicting student churn in school systems is essential for ensuring academic continuity and improving long-term educational outcomes. This work explores the use of Graph Neural Networks (GNNs) to model the complex relationships that influence a student's likelihood of dropping out or transferring. By representing students, classes, teachers, and social interactions as interconnected nodes within a graph structure, GNNs can capture patterns that traditional machine-learning approaches often overlook. The proposed framework integrates academic performance, attendance records, peer networks, and institutional factors to generate more accurate and timely churn predictions. Experimental results demonstrate that GNN-based models outperform baseline methods, offering deeper insights into how social and academic environments contribute to student disengagement. These findings highlight the potential of graph- driven analysis to support targeted interventions and help schools proactively address student retention challenges. "

Paper ID: 236

Smart Gird Management Using Machine Learning

SINGH, LOKESH*

Abstract: The surge in electricity demand worldwide and the adoption of environmentally friendly energy methods necessitate advanced power management techniques. Typical power grids are subject to significant energy losses due to inefficiencies, the theft of electricity from utilities, and the mismatch between supply requirements. A Smart Grid Management System that employs Machine Learning, Artificial Neural Networks (ANN), SVM, and Decision Trees is presented in this paper to optimize energy distribution, fault detection, & enhance grid security. The system incorporates IoT-based smart meters, real-time analytics, and anomaly detection methods to enhance grid efficiency and minimize transmission losses. By forecasting electricity demand, predictive models can enable energy distribution and dynamic load balancing through proactive mode. In addition, anomaly detection mechanisms can detect irregular consumption patterns, which may indicate electricity theft or system failures. Simulation results show a 20% reduction in transmission losses, 99% accuracy rate of fault detection and 30% less unauthorized energy consumption. The outcomes highlight the potential of machine learning and IoT in advancing smart grid infrastructures, leading to the development of energy networks that are data-driven and environmentally friendly. Additionally, Future research may involve the application of deep reinforcement learning to optimize grids and explore blockchain technology for secure and decentralized energy transactions. Additionally, machine learning could be utilized in future project.

Paper ID: 243

FluixyAI: A Prompt-Based AI Platform for Rapid Software Development

Tummala Mohan Aditya, Kiruthiga PJ , Bhavanam, Goddilla Prathyusha, Tumu Sai Spandana

Abstract: Designed with AI capabilities, Fluixy.ai seeks to narrow the gap between initiation and execution, turning user natural language prompts into usable software projects. Through development workflows that historically required tremendous time and effort, Fluixy.ai uses Watershed NLP, automated programming, and DevOps workflow automation to do the work of dozens of professionals. Fluixy.ai integrates app testing, deployment, full-stack code generation, and testing into a simplified more streamlined user interface to help them control complexity and spend as little time as possible. Fluixy.ai shrinks development timelines from weeks to just a handful of hours, removing many of the most salient barriers to entry people without a background in programming experience. Code quality is much more coherent between disparate programs than it traditionally was, further democratizing software development and resulting in rapid digital transformation. This study seeks to validate claims as to how the use of Fluixy.ai reshapes the future of software engineering. In particular, it shows how it fills the gaps that a code generation and no-code platforms do in terms of the scalability, customization, and reliability. In the end, the study demonstrates the need of the importance of interdisciplinary innovation and the intersection between people and AI automation tools.

Paper ID: 254

Trash to Treasure: An Intelligent Web-Based Platform for Sustainable Product Reuse, Resale, and Donation

M P, PRAHARSHANA*; G, Devi; G, Swathi; S, Mohammed Ifzan; V, Naveenprasanth; M, Nandhini

Abstract: The high rates of waste generation have been greatly contributed by the rapid urbanization and the lifestyles of consumers who use products and forget to reuse or use waste products. To solve this problem, the current paper suggests a smart web-based solution, Trash to Treasure that will assist in product reuse, resale, and donation among local communities.

The system enables clients to sell or give away unused furniture, electronics, books, and household goods. It combines such features as product categorization, GPS-based location discovery, user checkup, and rating apparatus to provide safe transactions. The system will help the community participate by linking sellers, buyers, and donors in one platform, and minimise waste disposal. System performance was assessed by simulation of product exchange data using simulation. The findings indicate that the platform is 92% efficient in reusing products, which is more effective than the disposal strategy and informal exchange. The system is also associated with a 67 percent decrease in the generation of the waste and communal involvement at 85 percent. These findings indicate that the platform can be used to facilitate the circular economy and sustainable sharing of resources. All in all, the suggested system offers a scalable and environmentally friendly system of converting the waste items into useful community resources.

Paper ID: 264

AI Fresh Mart– Online Shopping with AI Quality Prediction

Dantala , Sriram*; Lakshman , Angoth ; Krishna, S. ; Karunakar, M.

Abstract: "This document gives an introduction to an intel ligent online shopping platform designed to connect farmers and consumers directly without the involvement of a third party. The system includes three main roles: admin, farmer, and user (customer). Farmers can register and upload images of their products along with the price and quantity. Admins approve the registration and validate the uploaded images. A Convolutional Neural Network (CNN) and YOLOv5 v5m model have been trained using labelled vegetable images rated from 1 to 5 to assess freshness. The trained model predicts the freshness of newly uploaded tomatoes based on the given image. The system is implemented using Flask, Python, MySQL, and web technologies. Traditional marketing systems often fail to ensure freshness and transparency, leading to increased costs and customer dissatisfaction. Hence, this system integrates AI based freshness prediction to ensure quality and trust in online shopping"

Paper ID: 265

Electronic Device Type and Condition Detection using Simple CNN

Kumar , Dr. M. Kishore ; M, Preetam*; Vardhan, A. L. Vishnu ; B, Sankeerthana

Abstract: E-waste management demands quick identification of electronic devices, as well as physical condition checking of every device to know whether it can be recycled or not. This research focuses on the development of an uncomplicated and lightweight CNN model that is capable ofdetecting both the type and condition of an electronic device from the image data. A dataset with images of laptops, mobiles, tablets (labelled as either normal or damaged) was utilized for the training and validation of the model. Despite having unevenness in classes and changing device conditions, the model achieves accuracy of 96.99%, meaning it generalizes and performs well of new data. This model has low computational cost so that it is easily integrated into a website or an application. This work further illustrates the capability of deep learning in rapidly growing sustainable e-waste management.

Paper ID: 269

AN OFFLINE SIGN LANGUAGE TO SPEECH CONVERSION USING CNN-LSTM MODELS

Boora, Geetha*; Jukanti, Rekha; rodda, pavan; Kadava, Shanuteja

Abstract: Sign language is an essential tool for deaf and hard-of-hearing people to communicate with others without creating barriers in daily life between sign language users and non-signers creating a need for using tools like automated gesture-to-text, and gesture-to-speech system. This paper introduces an offline real-time system that converts static American Sign Language (ASL) alphabet gestures into spoken language using MediaPipe landmarks and a CNN–LSTM model. This system uses MediaPipe Hands to capture 21 precise points of the hand for each frame, which creates a compact 63-dimensional representation. These points are processed through two deep-learning models where first one is of a Convolutional Neural Network (CNN) which is used for static feature extraction, and the second one is of a CNN-LSTM hybrid model process for capturing temporal patterns. The models are being trained on a publicly available large dataset containing nearly 87,000 images across 29 ASL classes. After being evaluated, the results show that CNN–LSTM model achieves an overall accuracy of 74.22% on the ASL alphabet dataset. The performance metrics used in this are precision, recall, F1-score,and confusion matrix analysis which indicate that the model perform consistently and identify most static letters making a place to create errors among the most similar letters like M, N, and S. The recognized gestures are combined into meaningful text and converted into speech using an offline pyttsx3 engine which allows full functionality without the need of internet. Since all components function well on standard hardware, the proposed system is suitable for low-resource environments and small communities where they have limited technological access.

Paper ID: 271

Cloud Based, Threat Detection Using Machine Intelligence in Virtual Environments

Korra, Khoushik*; Shiva, J; Jayanth, Sadurla; Dileep Kumar, Pasarthi

Abstract: "The rise of cloud computing is unimaginable without its widespread adoption over the last few decades since it enables individuals or organizations to store and retrieve data anywhere, at any time, provided they have an internet connection. However, due to the nature of being open-access, high-volume traffic flows and constantly being connected result in a large number of attacks. Traditional security solutions are often inadequate for providing protection against these types of large scale threats (DDoS). This study proposes a cloud-based intrusion detection and prevention solution that uses ML with additional low-level cryptography (ECC) to combat these threats. Supervised learning methods were employed on publicly available intrusion detection datasets to build models capable of distinguishing between valid user activity and malicious user behavior. The proposed framework employs the use of Elliptic Curve Cryptography (ECC) along with RSA to provide security for file transaction and to ensure the integrity and confidentiality of user data and interaction within the cloud. Lastly, the proposed solution will incorporate a simple web based interface to allow real-time monitoring, secured file handling, and provide automatic alerts concerning potentially malicious user behavior identified during normal operations of the cloud services. Based upon experimental results, it can be concluded that combining the use of ML for threat detection along with ECC and RSA creates a much more robust level of security for the cloud environment. The proposed IDS/IPS framework provides an effective appealing solution for improving contemporary secure levels offered by various multiuser based trust computing applications. "

Paper ID: 273

UAV-Aided SWIPT for IoT Network: Joint Communication and Energy Delivery

Dova, Arya*; Bukya, Mohan Babu; Danam, Swapna ; Jashwanth, Addagulla

Abstract: " There are increasing interests on using UAVs equipped with the technology that makes it possible to conduct SWIPT, particularly in the cases where the traditional communication infrastructure is absent or limited. Additionally, their limited onboard battery capacity sets very strict operational constraints and thus makes trajectory planning a difficult task. Using the existing Path strategies or Nearest Neighbor disregard the intricate relationship among energy, hovering duration and return to base feasibility. As a result, these methods produce trajectories with very long mission durations, missed service deadlines, and premature energy depletion. In that respect, this paper introduces an energy, aware dynamic trajectory planning algorithm, called Greedy + RTB. The system incorporates a predictive energy filtering mechanism that imposes a strict return to base constraint thereby making it impossible for the UAV to commit to a path it cannot safely finish. Comprehensive simulations prove that the proposed system accomplishes the mission within 117 slots, which is 66.6% less than the conventional baselines requiring 350 slots. It also achieves a 93.3% service ratio, with F2 score of 0.94, confirming the predictive energy constraints and urgency-aware scheduling as critical enablers of both reliability and efficiency for UAV-assisted SWIPT missions."

Paper ID: 273

UAV-Aided SWIPT for IoT Network: Joint Communication and Energy Delivery

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Paper ID: 275

Automated Skin Cancer Detection Using Deep Learning

Mattegunta, Saketh*; Bhookya , Ramesh ; Gurram, Pranakshitha; Jella, Nikhil

Abstract: Among the most common human health disorders worldwide are skin diseases, particularly skin cancer. Accurate and early diagnosis is essential for proper treatment and management. The following project studies a new paradigm for skin disease detection by using deep learning and feature extraction methods. For this research, a skin cancer dataset, incorporating Principal Component Analysis (PCA), Random Forest feature extraction, and state-of-the-art Convolutional Neural Networks (CNNs) such as VGG16, ResNet, and Inception V3, are used. Three different approaches are assessed: (1) feature extraction using PCA followed by model training, (2) direct training without feature extraction, and (3) feature extraction using Random Forest followed by model training. The comparative study of model accuracies is done to find the optimal fashion. We implement the best-performing model, Inception-based, in a Flask web application for real-time skin disease prediction. This system aims at providing a reliable and efficient tool for dermatological diagnostics, which shows its potential of AI in healthcare.

Paper ID: 278

Sleep Disorder Prediction using Machine Learning

Medipally, Sreeharsha*; Ashwini, Padala; Thanuj, Chaduvu; Bhashwitha , Bondugula ; Saketh, Sheri

Abstract: "Sleep disorders such as insomnia and obstructive sleep apnea are the problem of many people, and they do not pay much attention or even know how dangerous it is. Bad sleep does not just leave a person feeling fatigued but can actually influence the heart, brain and the psyche slowly. More often these issues can only be diagnosed through sleep tests which are costly, complex and consume a lot of time, at the hospital. This project will develop a smart system to detect sleep disorders through machine learning to simplify the process. The system predicts possibility of an individual to have a sleep disorder using a simple health and lifestyle data instead of utilizing the actual medical test which cost a lot. A number of machine learning models were tested and Gradient Boosting led to the best results with accuracy of 93.75 which is good compared to the previous AI-based methods. The system is created as a basic web based application which can be used by anyone. A patient has the option to test the risk of sleep disorder of one individual or upload an Excel file to test numerous individuals simultaneously. This renders the solution cost-effective, viable, and applicable in the real life. The system can be further enhanced in the future with the assistance of wearable information, sophisticated algorithms of AI, as well as cloud services, and early identification of sleeping disorders will become even more convenient. "

Paper ID: 282

SMART SERVE:An AI-Assisted Food Donation ManagementSystem for Reducing Food Waste

Voggni, Anuradha*; Raghavendra, Sarala; Sruthi, Nunsavath; Hari Krishna, Ramavath

Abstract: "Food wastage is a major global challenge that requires efficient mechanisms to redistribute food that is no longer call for, to organizations that cater for vulnerable groups. This research is an AI assisted Food Donation Management System using Flask based Web-Framework, Multi-role Authenticaiton, Real time Donation Monitoring and Automated Communication Pipeline between Donor and NGOs.

The system has geo- tagged donation tracking, a lightweight data storage method with the use of the JavaScript Object Notation (JSON) and workflow automation where emails trigger the workflow to decrease the manual intervention are used to improve transparency. Amachine learning model is incorporated to anticipate possible food wastage based on contextual aspects like type of event, number of guests, seasonality and way of preparation so donors, especially the restaurant industry, can avoid overproduction. The platform offers donor, non-governmental organisations (NGOs) and administrators dashboards to efficiently coordinate, handle requests and provide historical analytics. Experimental Evaluation Proves the system is able to successfully automate donation processing, enhance the donor-NGO connection, and provides predictive insights for food sustainability."

Paper ID: 287

Automated Detection Of Dark Patterns In Digital Interfaces Using Machine Learning And Deep Learning

Vegesna, Deepika*; Bodhan, Laxman; Mathangi, Abhishek; Vudem, Vishwanjal Reddy; Akula, Devi Sri Charan

Abstract: Dark patterns are now found in deceptive design techniques used by websites to manipulate their users into doing actions they themselves did not intend for them to do, like registering in a service, accepting a price under the guise of being a term of service, or sacrificing time due to a perceived sense of urgency. Such strategies lead to a loss in finances, loss of user confidence, and invasion of user privacy. The conventional rule-based or keyword-based methods of detection are too limited and strict to detect the dark patterns in designs that are continuously evolving. Our project is a solution to this increased problem as it develops an intelligent and real-time detection system, which employs deep learning and machine intelligence to detect dark patterns in websites . This finding is founded on the dual-model design, which relies on MobileNetV3 to identify visual dark patterns in the elements of UI and Bidirectional Long Short-Term Memory (BiLSTM) networks with GloVe embeddings to assess the textual dark patterns, including manipulative language. The application is based on TensorFlow Lite on-device and is capable of providing real-time alerts to users without compromising their privacy. It is created as a Chrome extension.

Paper ID: 288

Assessing Climate-Driven Impacts on Agricultural Land Suitability Using Explainable Machine Learning Models

Joshi, Manaswini*; Nayak, Sanjib; Surendra, Mode; Naveen, Velisala

Abstract: Climate change is one of the main reasons behind the changes occurring in agriculture. Since a large portion of agricultural land is located in Europe and Asia, this study focuses on land datasets from these regions. Ongoing climatic changes are creating uncertainty in long-term agricultural planning. This study develops an interpretable machine-learning approaches which includes algorithms like SVM, KNN, Random Forest, and XGBoost to evaluate how future climatic variations may influence land suitability for crop production in the region. A large land database consisting information about land properties including land quality (soil properties, land topography and previous land use) is used to develop and test land suitability models. The optimum model was then used in conjunction with a known interpretation scheme to determine the relative importance of climate, driven influences on land suitability. This work highlights the value of transparent applications of machine learning for informing climate adaptive agricultural risk management in Eurasia.

Paper ID: 293

ML-Powered Intelligent Workload Balancer

reddy, V. Tejaswini*; Sirimalla, Tejashri; Surnila, Harshitha; Mishal, Vivekananda

Abstract: "In today's world, people have been working from home or other locations. Hence, because of this, it has been difficult for people to distribute their work equally. People have more work or people have less work to do.In this scenario, in order to come up with a solution for this problem, we came up with a smart system called 'ML-Powered Intelligent Workload Balancer'. The idea is quite simple to understand. The system identifies who is free, who is busy, what are their capabilities, when they are ready. Hence, they are allocated work accordingly.This system also tracks the working process of the people and gives alerts to not overload one person. During the testing phase of the system, it maintained equilibrium in the workload distribution, reduced overload situations, and completed the task successfully compared to manual allocation."

Paper ID: 294

Designing a Decentralized Electronic Voting Framework Based on Blockchain

Reddy, Anusha*; Patel, Sanjana; singh, Raghunath

Abstract: The Rise of Online voting is growing fast on these days. It is great because it saves money and encourages more people to participate. Since you don't need printed papers or a physical polling station, people can record their votes from anywhere, as long as they have an internet connection. But even with these improvements, many people still do not believe about using online voting because it brings new security risks. Even one small error in the system can cause a large scale of vote tampering. To believe electronic voting system, it must be transparent, accurate, secure, and easy to use. To overcome these issues, Blockchain technology was introduced. It has decentralized system and provides end-to-end verification for the secure electronic voting system. Probably, Blockchain is a strong alternative to current traditional e-voting due to its offering of redundancy, high security, and cannot be subject to unauthorized access. The main purpose of this study is, analyzing the current progress of blockchain based voting systems, understanding the challenges while developing, and predicting how these systems resolve the issues and how they might be able to develop in the future.

Paper ID: 300

Urban Data Fusion Framework for Real-Time Traffic and Incident Prediction Using Spatio-Temporal Learning

palleboina, Lakshyani*; A, mahendar; D, Mounika; E, Surya Charan Reddy

Abstract: Traffic congestion and road accidents have become more serious due to the fast urbanisation, heavily burdening existing transportation management systems. Conventional traffic observation methodologies based on standalone information sources have limited capacity to depict complicated and dynamic urban mobility behaviours. We contribute a City Data Fusion Framework for Traffic & Incident Prediction, which fuses multi-type data sources such as IoT traffic sensors, GPS trajectories, CCTV video analytics, weather reports and social media reports to form one fused predictive model. The proposed scheme is based on the integration of hierarchical data fusion and a spatio-temporal machine learning algorithm for traffic flow analysis, anomaly detection with near-real-time incident forecast. Spatial relations are modelled by deep learning architectures and graph-based representations, and temporal dynamics are captured via sequence learning methods. Experimental results show that integrating a wide variety of data enhances situation awareness and traffic state prediction better compared to the use of a single source, which uses only a limited number of datasets. The findings show that the proposed scheme can facilitate proactive traffic control, timely emergency rescue and sophisticated decision making for a smart city.

Paper ID: 303

REVOLUTIONIZING AGRICULTURE: MACHINE AND DEEP LEARNING SOLUTIONS FOR ENHANCED CROP QUALITY AND WEED CONTROL

Reddy, Ashritha*

Abstract: "Agricultural productivity increasingly depends on intelligent automation to handle challenges in crop monitoring and weed management. In order to address issues with weed control and crop monitoring, agricultural productivity is becoming more and more dependent on intelligent automation. In order to evaluate crop quality and identify weeds in real-time from useruploaded photos, this work presents a machine learning and deep learning system. To increase feature clarity, the suggested webbased platform incorporates a structured preprocessing pipeline that includes background removal and grayscale conversion. For parallel crop classification, a convolutional neural network (CNN) model and conventional machine learning classifiers are employed. To increase prediction reliability, a voting mechanism is combined with their outputs. Furthermore, weed-affected areas in crop photos are precisely located using the YOLOv8 object detection model. The system, which was developed using the Django framework, offers user-friendly visualization interfaces, efficient image handling, and safe authentication. Results from experiments indicate high accuracy in both classification is demonstrated by experimental results and tasks related to detection. This demonstrates the system's efficacy as a helpful tool for contemporary precision agriculture decision-making. By integrating AI-driven analytics with conventional farming methods, the method provides a scalable way to enhance crop sustainable agricultural management and health monitoring. "

Paper ID: 304

Design and Implementation of an AI-Based Subjective Exam Evaluation System

Erraguntla, Sai Vamshi *; B , Ramesh; D , Pavan Kumar ; B, Charan

Abstract: Evaluating descriptive answers is often time consuming, prone to human errors and personal bias. Unlike objective answers, descriptive answers can be interpreted in multiple valid ways which depends on how the student understands the concept. So to minimize the error, we developed a system that uses Machine Learning and Natural Language Processing to evaluate and grade answers. The system takes the user's answer as input, preprocessing it using NLP techniques, compares it with reference answer and then assigns score on the basis of accuracy of the answer written. The system consists of two main interfaces: the admin interface to provide question and answers and the user interface to write and check the result of the exam written. The system uses Naive Bayes for grading the answer and techniques such as Tokenization, word mover distance, Cosine similarity to preprocess and check similarity with the reference answer.

Paper ID: 307

Eye Movement Controlled Cursor Using OpenCV–A Hands-Free Mouse Solution

Swetha, Thadem*; Suchithra, Ravula

Abstract: "The project titled "Eye Movement Controlled Cursor Using OpenCV, A Hands-Free Mouse Solution" aims to develop a smart, vision-based system for human-computer interaction. This system allows users to control the cursor through real-time tracking of eye movements. As the demand for touch-free interaction and accessibility tools grows, especially for people with motor disabilities, traditional input devices like keyboards and mice fall short. To tackle these issues, this project suggests a low-cost, non-intrusive, camera-based solution that removes reliance on physical devices for computer navigation. The proposed system uses OpenCV, facial landmark detection, and pupil-tracking algorithms to capture eye movements via a standard webcam. It processes these features to determine gaze direction, which enables cursor movement on the screen. Users can perform mouse actions like left-click, right-click, and double-click by using voluntary blinks. By integrating computer vision techniques such as Haar cascade detection, Dlib's 68 facial landmark model, thresholding, and contour extraction, the system delivers reliable performance in normal lighting. A series of experiments was carried out to test the speed, accuracy, and responsiveness of the eye-controlled mouse. The results show that the system can accurately detect gaze shifts and execute corresponding cursor movements with little delay. The blink-based clicking also performed well, confirming that eye gestures can work effectively for common computer tasks. Overall, the proposed system presents an effective and user-friendly alternative to traditional mouse devices."

Paper ID: 308

SmartSaver Cart: A Real-Time Price Comparison and Coupon Optimization System

Orike, Raju*; Bhukya, Shankar Nayak ; Thati, Abhinay; Nayini, Prashanth

Abstract: SmartSaver Cart is an automated system, aimed at enhancing online shopping by offering real- time price comparisons and automatically choosing coupons. The system picks up live product information from numerous online stores via web automation, then processes this information to find the lowest price available to the user. A coupon optimization module checks for valid coupons, analyzes their condition, and selects the best coupon automatically without requiring user effort. It has a secure and scalable web architecture backing its core, which fetches correct results using dynamic data extraction. By saving time from manual searches and improving cost efficiency, SmartSaver Cart provides a fast, easy, and user-friendly solution to modern-day online shoppers.

Paper ID: 311

Optimization of Task Distribution of Fog-Cloud Systems with regards to Energy Consumption andProcessing Latencies

G, KAARTHIGA*; M K, PRIYANGA; L, POOJASHALINI

Abstract: "FogCloud computing paradigm: This is critical in helping the delay-sensitive and energy-constrained services, including IoT analytics, smart medical monitoring, and autonomous digital platforms. The effective scheduling of tasks on distributed nodes of fogs and centralized cloud systems is a complicated research issue because of the changing workloads, resource variable capabilities, untrustworthy network-based actions, and limited availability of fog energy. The study article proposes a powerful schedule model named DELTa (Dynamic Energy- and Latency-Aware Task Scheduling) that aims at maximizing the execution delay and energy consumption in the Fog-Cloud systems. In the given research paper, the parameters of the runtime such as task urgency, computational demand, fog node power status, communication delay, and cloud processing overhead are constantly assessed. According to multi-objective decision analysis, it is executed in a fog layer or cloud layer based on the adaptively chosen execution location to meet Quality of Service requirements. This should be done with adaptive load distribution and real-time scheduling decisions, which allow efficient management of dynamic task arrivals and resource heterogeneous circumstances. Through experimental analysis, there is significant increase in execution performance and energy efficiency as compared to traditional static scheduling strategies. The model of output implementation proposed shows the highest accuracy in optimal tasks placement decisions of 96.8 percent, with the ability to maintain steady latency and energy-saving attributes at different levels of workload. The validity of performance analysis confirms the increased scalability, reliability and sustainability of Fog Cloud-based service deployment."

Paper ID: 331

REAL TIME AI SIGN BRIDGE

S, Nivetha*; G, Swathi ; N, Vijalakshmi; B, Naren Chowdry; CS, Krishnaganth

Abstract: The Real-Time AI Sign Bridge is an innovative system designed to facilitate seamless communication between individuals with hearing and speech impairments and the general public. This project leverages advanced techniques in Artificial Intelligence (AI) and Computer Vision to recognize sign language gestures in real time and convert them into meaningful text and speech outputs.The system uses a camera to capture hand gestures, which are then processed using machine learning models to identify corresponding signs. The recognized gestures are translated into readable text and further converted into audible speech using text-to-speech technology. This enables effective two-way communication and reduces the communication gap faced by differently-abled individuals in everyday interactions. The proposed system is designed to be user-friendly, efficient, and scalable. It can be implemented using technologies such as OpenCV, MediaPipe, and machine learning frameworks, along with a simple frontend interface for displaying results. The project emphasizes real-time performance, accuracy, and accessibility. By integrating AI-driven gesture recognition with intuitive output mechanisms, the Real-Time AI Sign Bridge aims to promote inclusivity and provide a practical solution for enhancing communication accessibility in society.

Paper ID: 340

Navigating the rare:A Multi Agent-System for Rare Neurological andGenetic Disorder Diagnosis

K, Aparna*; A K, Aksha; H, Aarthi

Abstract: Neurological and genetic disorders are mostly uncommon and difficult to detect because available data is inadequate, such disorders portray similar symptoms, and due to delayed diagnosis. Such difficulties often lead to a longer period of diagnostics and low effectiveness of treatment. The paper offers a description of a novel multi-agent artificial intelligence-based diagnostic system, called Navigating the Rare, that helps clinicians identify rare diseases in the early and accurate stages. The suggested system utilizes the methods of natural language processing to identify clinical features in the unstructured user input and matches them with standardized Human Phenotype Ontology (HPO) terms. Embedding models make use of high-dimensional space to show semantic connections in order to characterize phenotypic features.The scheme incorporates the similarity retrieval capability of FAISS to find the relevant cases in history and employs a model of two-tower ranking to forecast and prioritize the potential disease. To tackle uncertainty and unresolved information, a dynamic process of clarification using a large language model, which generates specific questions, is used to refine the diagnostic process. Also, the system facilitates automatic generation of reports and case storage to enable continuous learning and improvement. According to the results of the experimental work, the suggested methodology improves the level of diagnostic accuracy, minimizes the level of ambiguity, and offers effective decision support to clinicians. The article emphasizes the opportunity of using multi-agent architecture and advanced AI methods to enhance the diagnosis of rare diseases and patient clinical outcomes.

Paper ID: 339

Automated Mock Interview System Using Resume Analysis and Adaptive AI for Personalized Skill Assessment

Vaishnavi Kankipati, Mahendar A, Nithin Katroth, Vamshi Tippani

Abstract: The increasing demand for effective interview training has led to the creation of intelligent systems that emulate real-world interview environments and deliver customized feedback. In this study, we propose a mock interview system that automates the entire scoring process by analyzing resumes with adaptive question generation and instantaneous performance evaluation. Natural Language Processing (NLP) techniques are applied by the system to process user resumes and capture skills, experience, and domain knowledge in a structured way. Using this profile as a guide, hybrid question generation (i.e., some combination of rule-based templates and AI-driven models) can be employed to generate context-aware questions that cater to the role of the audience members, along with dynamic difficulty adjustment. An interactive simulation module allows users to answer through text or voice, closely mirroring actual interview situations. The responses are assessed against relevance, completeness, fluency, and semantic accuracy using a multi-criteria evaluation framework, generating both quantitative scores and qualitative feedback. Experimental results show that the resume parsing and evaluation have high accuracy and good consistency. The system then uses a recommendation engine to generate customized strategies for improvement, reinforcing the learning process. In summary, the proposed framework provides a scalable and efficient approach to enhancing interview preparedness and professional competency development.

Paper ID: 341

REAL TIME VEHICLE DAMAGE DETECTION, SEVERITY AND COST ESTIMATION USING COMPUTER VISION

Uma Maheshwari P, Thenmalar S

Abstract: Vehicle damage assessment is critical to accident investigation and insurance claims processing. Traditional manual inspection methods are time-consuming, labour-intensive, and prone to human inconsistency. This paper presents a real-time automated system for vehicle damage detection, severity classification, and repair cost estimation using computer vision. The proposed pipeline employs the RT-DETR (Real-Time Detection Transformer) to localise damaged regions in both images and video. Detected regions of interest are passed to a Convolutional Neural Network (CNN) classifier that categorises damage severity as Minor, Moderate, or Severe. A regression-based cost model estimates repair expenditure, and temporal smoothing maintains prediction consistency across video frames. The system achieves precision of 0.92, recall of 0.92, and F1-score of 0.91 on a test set of 1,281 images, outperforming the best baseline (YOLOv8, F1 = 0.88) by 3.4 percentage points. End-to-end inference latency is 97 ms on an RTX 3090 GPU, satisfying the sub-100 ms real-time requirement. The cost estimation model attains an R^2 of 0.93 and mean absolute percentage error of 8.4%. The proposed system provides an accurate, efficient, and unified pipeline for automated vehicle damage assessment, with strong potential for deployment in insurance and fleet-inspection applications.

Paper ID: 350

SMART CROP ADVISORY SYSTEM USING LOCALIZED RISK INTELLIGENCE

Madhumita S, Ramyasree V, Reshma R, Buvaneswari B

Abstract: Agricultural productivity is highly dependent on localized environmental and soil-specific conditions, which are often inadequately addressed by conventional, generalized crop advisory systems. Variations in soil nutrients, climatic conditions, seasonal patterns, and water availability significantly influence crop growth, yield stability, and economic returns. The Smart Crop Advisory System Using Localized Risk Intelligence is a data-driven decision support system designed to provide region-specific, risk-aware agricultural recommendations to farmers. The proposed system analyzes critical soil parameters and moisture levels, along with localized climatic factors. K-Means clustering is employed to group similar soil profiles, enabling the identification of localized risk zones and crop suitability patterns. Based on these clusters, the system recommends suitable crops, intercrops, fertilizers, and irrigation strategies optimized for regional conditions. Additionally, a rule-based advisory framework is integrated to generate seasonal risk categorization, crop suitability scores, and basic pest and disease risk awareness without relying on predictive machine learning models. The system also provides preventive agronomic guidance and market location suggestions to improve profitability. Experimental evaluation demonstrates improved advisory relevance, reduced cultivation risk, and enhanced decision accuracy compared to traditional advisory approaches. The proposed system contributes to sustainable agriculture by enabling informed decision-making, improving soil health, increasing crop yield, and supporting farmer income stability.

Paper ID: 368

Spectral Equilibration Using HyperGraph-Diffusion cGAN with Dual-Level Fractal Feature Rebalancing in MATLAB

Priya, Anu*; Priya, Anu

Abstract: Illegal building constructions and unauthorized additional floors pose serious challenges to urban planning, safety, and governance. This project presents a novel approach for detecting such violations using satellite imagery through Spectral Equilibration Using HyperGraph-Diffusion Conditional Generative Adversarial Networks (cGAN) with Dual-Level Fractal Feature Rebalancing implemented in MATLAB. The proposed method enhances spectral consistency and structural clarity of satellite images by equilibrating multispectral bands and modeling complex spatial relationships using hypergraph diffusion. Dual-level fractal feature rebalancing further improves the representation of fine architectural details and edge patterns, enabling precise discrimination between authorized and unauthorized structures. The enhanced images are then processed using a cGAN framework for accurate segmentation and classification of illegal constructions. Experimental results demonstrate improved detection accuracy, reduced false positives, and robust performance across diverse urban environments. This system offers a reliable and automated solution to assist government authorities in monitoring urban growth and enforcing building regulations effectively.