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NACORE 2024
NATIONAL CONFERENCE ON RESEARCH IN EMERGING AREAS

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National Conference on Research in Emerging Areas (NACORE 24)

EDITORIAL BOARD

Message from Director Administration

I am pleased to extend a warm welcome to all attendees of the fourth National Conference on Emerging Research Areas (NACORE-2024) hosted at our esteemed institution. It fills me with pride to witness such a distinguished gathering of experts and professionals from across the country, united as one scholarly community. Your presence here signifies a shared commitment to advancing research and fostering innovation. We are honoured to host such a vibrant assembly dedicated to exploring the frontiers of knowledge.

This conference aims to foster global collaboration and promote the exchange of ideas and innovations from diverse perspectives. With the technical co-sponsorship of Kerala State Council for Science, Technology and Environment (KSCSTE) and ACM Kottayam Professional Chapter, and an array of thought-provoking sessions and distinguished speakers renowned for their contributions, NACORE-2024 will be an enriching and valuable experience for each of you. While NACORE-2024 encompasses a broad range of topics in Computer Science, it places a special emphasis on Cyber Security, aiming to showcase cutting-edge research in this critical area.

I extend my heartfelt regards to all participants and Organizers and also wish you a fruitful and successful conference. Thank you for being part of NACORE-2024 and contributing to the advancement of knowledge in emerging research areas.

Fr. Dr. Roy Abraham Pazhayaparampil
Director-Administration
Amal Jyothi College of Engineering
Kanjirapally

Message from Director Research

With great pleasure and utmost pride, I extend my warmest greetings to all the distinguished attendees of the National Conference on Emerging Research Areas (NACORE-2024), organized by the Department of Computer Science and Engineering at Amal Jyothi College of Engineering. From April 24 to 26, 2024, our conference will serve as a platform for intellectual exchange, collaboration, and dissemination of cutting-edge research in emerging areas of computer science and engineering. This esteemed gathering of academics, researchers, professionals, and industry experts promises to be a melting pot of ideas and innovation, creating a fertile ground for advancing knowledge in our rapidly evolving discipline.

I want to express my heartfelt admiration and appreciation to the organizing committee for their meticulous efforts in bringing together this significant event. Their dedication, foresight, and passion have been instrumental and truly shaped this conference into a prestigious and intellectually stimulating experience. Their hard work and commitment are truly commendable.

As the Director of Research at Amal Jyothi College of Engineering, I take immense pride in our institution's commitment to fostering research and innovation. We firmly believe that conferences such as this provide a valuable platform for the exchange of ideas and hold the potential for new collaborations and the expansion of our collective knowledge. I encourage all participants to actively engage in meaningful conversations, network with fellow researchers, and explore the exciting opportunities for future collaborations that this conference offers.

Finally, I would like to express my heartfelt gratitude to all the participants. Your presence and active involvement are not just important but crucial in creating an intellectually stimulating environment to propel our field forward. Thank you for being part of NACORE-2024, and I wish you all a fruitful and successful conference.

Dr. **Z V Lakaparampil**
Director - Research
Amal Jyothi College of Engineering

Message from Principal

I extend my sincere appreciation to the Department of Computer Science and Engineering for successfully organizing the fourth National Conference on Emerging Research Areas (NACORE-2024). This remarkable event, supported by the technical co-sponsorship of Kerala State Council for Science, Technology and Environment (KSCSTE) and ACM Kottayam Professional Chapter, exemplifies our commitment to fostering innovation and excellence in research.

While NACORE-2024 covers a wide array of topics within Computer Science, I understand that the main focus this year is on Cyber Security. Conferences aim to bring together diverse viewpoints and cutting-edge research under one roof, creating opportunities for in-person idea exchange, research collaboration, and the establishment of national and international partnerships for future endeavors. The themes and sub-themes of this conference underscore the critical importance of these research areas.

Having such a diverse group of researchers, engineers, and computer scientists from academia, government, and industry working together is invaluable. Their unique perspectives and innovative ideas will undoubtedly lead to significant advancements and opportunities in the field of Cyber Security and beyond.

I wish the organizers and delegates a very successful and fruitful conference. May NACORE-2024 be a catalyst for ground-breaking research and long lasting collaborations.

Dr. Lillykutty Jacob
Principal
Amal Jyothi College of Engineering
Kanjirapally

Message from HoD

On behalf of the Department of Computer Science and Engineering, it is my pleasure to extend warm greetings to everyone attending the National Conference on Emerging Research Areas (NACORE 2024). This year's conference focuses on the theme "Emerging Research Areas" and is designed to spotlight the latest developments and innovations in both research and real-time applications.

The three-day event provides a unique platform for researchers, academicians, and professionals to present their findings, share insights, and engage in meaningful discussions. I am confident that NACORE 2024 will not only highlight significant research contributions but also stimulate personal and professional growth among the participants. The diverse range of expertise and perspectives gathered here will undoubtedly foster an atmosphere of intellectual enrichment and collaborative dialogue.

I would like to extend my heartfelt congratulations to my dedicated team for their efforts in organizing this conference. Securing financial sponsorship from the Kerala State Council for Science, Technology and Environment (KSCSTE) and technical sponsorship from the Association for Computing Machinery (ACM) is a testament to their hard work and commitment.

Furthermore, I express my sincere gratitude to the technical program committee members, conference organizers, sponsors, and participants. Your invaluable contributions and support have been instrumental in bringing this conference to fruition.

I hope NACORE 2024 will be an enriching experience for all, inspiring us to delve deeper into our research pursuits and collaborate towards innovative solutions. Let us take this opportunity to learn, connect, and grow together.

Dr. Juby Mathew

Head of the Department, Computer Science and Engineering

Amal Jyothi College of Engineering

Kanjirapally

Message from the Organizing Chair

It is my honor and privilege to serve as the organizing chair for **Fourth National conference on Research in Emerging Areas-24(NACORE 24)**. As we gather here, whether in person or virtually, we come together with a shared mission: to advance the field of cyber security, exchange innovative ideas, and foster a community dedicated to making our digital world safer and more secure.

In today's rapidly evolving technological landscape, the challenges we face in cyber security are more complex and critical than ever before. This conference provides a unique platform for researchers, practitioners, policymakers, and industry leaders to collaborate and address these pressing issues. Our agenda is packed with insightful keynote presentations, cutting-edge research papers, interactive workshops, and thought-provoking panel discussions. Each session is designed to inspire, educate, and spark meaningful conversations.

I would like to extend my heartfelt thanks to all the speakers, researchers, and particpants whose dedication and hard work have made this conference possible. Your contributions are invaluable and greatly appreciated.

Additionally, I encourage all attendees to actively participate in the discussions, network with your peers, and take advantage of the opportunities to share your own experiences and insights. It is through our collective effort that we can drive innovation and create robust solutions to protect our digital infrastructure.

Thank you for being a part of the **Fourth National conference on Research in Emerging Areas-24(NACORE 24)**. Together, we are shaping the future of cyber security.

Prof. Syam Gopi
Organizing Chair – NACORE 2024
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***Abstract*—**Local Wanderer is a web application designed to enrich the travel experience by connecting users with local destinations. It offers personalized trip recommendations, interactive maps, real-time updates on local events, and a community-driven review system. By leveraging location-based services and user-generated content, this empowers travelers to make informed decisions and immerse themselves in authentic experiences. Integration with social media platforms encourages sharing moments and building a vibrant travel community. The project aims to redefine exploration, promoting sustainable tourism and supporting local economies.

Keywords—Location-based services, User-generated content, Local Wanderer.

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Weed detection using YOLOv3 and elimination using organic weedicides with Live feed on Web App

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***Abstract*—**The article discusses the pressing issues in agri- culture, particularly highlighting the significance of detecting and categorizing weeds. Weeds pose a threat by competing with crops for vital nutrients, traditionally addressed through manual detection and herbicide application. However, recent technological progress has focused on automating weed detection using methods such as YOLOV3, a CNN-based object detection technique. In addition, the article introduces a fresh approach that utilizes linear actuators and organic weedicides for weed control. It evaluates this system's effectiveness in terms of preci- sion and dynamic intrarow weeding through various analyses and experimental trials, demonstrating high accuracy and efficiency in real field scenarios. The live video footage of weed detection and removal is also showcased on a web application, providing users with information on the number of weeds eliminated. This integration of technological and chemical solutions presents a promising strategy for managing weeds in agriculture.

Keywords—weed detection, crop, CNN, YOLO, dataset, digital farming, agriculture, deep learning, Dynamic intrarow weeding, linear actuators, parallel mechanism (PM) design, performance analysis, live feed, web app.

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Cataract Detection using Digital Camera Images

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***Abstract*—**Cataracts, a common eye condition, are a major cause of vision problems worldwide. Finding cataracts early is important so that they can be treated right away.Slit lamps and fundus cameras are two common instruments used to detect cataracts; both are very expensive and require domain expertise.Therefore Cataract may remain undetected at early stages, and when detected at later stages it need expensive medical intervention. In this paper we propose a novel approach for cataract detection from digital images which is a solution to the above mentioned problem. Here we utilize a Convolutional Neural Network (CNN) model for image classification. Use of smartphones for capturing images and detection of cataract lead to simple and easily accessible solution to cataract detection to common people.

Keywords—Cataract, CNN, VGG-16, ResNet, Inception V3

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GESTURE SPEAK: Bridging communication gaps with Glove-based Sign Language Recognition

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***Abstract*—**This paper introduces an innovative method to improve communication for individuals who are deaf and mute by leveraging hardware technology. Through the integration of sensors and machine learning algorithms, our portable device can interpret sign language gestures in real-time, transforming them into spoken language or text. The system's intuitive design and portability make it an ideal solution for empowering individuals with hearing and speech impairments to participate more fully in social, educational, and professional settings, promoting inclusivity and accessibility.

Keywords—Sign language recognition, Hardware-based communication systems, Accessibility, Inclusivity, Wearable technology, Machine learning algorithms, Social integration, Assistive technology

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A Review of Parkinson Disease Detection Techniques

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***Abstract*—**Parkinson's disease (PD) is a progressive disorder that is caused by degeneration of nerve cells in the part of the brain called the substantia nigra, which controls movement. These nerve cells die or become impaired, losing the ability to produce an important chemical called dopamine. Studies have shown that symptoms of Parkinson's develop in patients with an 80 percent or greater loss of dopamine-producing cells in the substantia nigra. Normally, dopamine operates in a delicate balance with other neurotransmitters to help coordinate the millions of nerve and muscle cells involved in movement. Without enough dopamine, this balance is disrupted, resulting in tremor (trembling in the hands, arms, legs and jaw); rigidity (stiffness of the limbs); slowness of movement; and impaired balance and coordination – the hallmark symptoms of Parkinson's. The cause of Parkinson's essentially remains unknown. However, theories involving oxidative damage, environmental toxins, genetic factors and accelerated aging have been discussed as potential causes for the disease. In 2005, researchers discovered a single mutation in a Parkinson's disease gene (first identified in 1997), which is believed responsible for five percent of inherited cases.

Keywords—Parkinson's disease, Deep learning, Multi-modal data analysis, Disease prediction

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Blockchain Enhanced Web Application for Anonymous Drug Abuse Reporting and Recovery in the Indian Context

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***Abstract*—**This paper presents a comprehensive web application designed to address the pressing issue of drug abuse in India. The application, underpinned by blockchain technology, provides a secure and anonymous platform for reporting drug abuse incidents and supporting recovery efforts. The unique socio-cultural landscape of India is taken into account, with the aim of fostering community engagement, motivating recovery, and combating the stigma associated with addiction. The integration of blockchain technology ensures user privacy and streamlines reward redemption, enhancing the overall user experience. This comprehensive solution represents a significant step forward in India's fight against drug abuse. The paper delves into the societal norms and recovery challenges in India that often discourage open discussions about addiction, leading to reluctance in seeking help and recovery. It also highlights the inefficiencies in current reporting mechanisms that lack anonymity, putting whistleblowers at risk. This discourages reporting and undermines efforts to curb drug abuse. The proposed application addresses this issue by providing a secure, anonymous reporting channel. Furthermore, traditional recovery methods face challenges in engaging individuals due to cultural barriers and social stigma. The application's recovery section incorporates motivational content and success stories tailored to resonate with India's cultural context. The paper also discusses the design and functionality of the anonymous reporting section and the recovery support section of the application. Blockchain integration for security and transparency is another key aspect covered in this paper. Blockchain technology guarantees anonymity, ensuring the safety of whistleblowers and contributing to efficient reward redemption. Users' earned tokens are securely stored in their blockchain accounts, enabling direct token to coupon conversion. This eliminates the need to navigate forums and ensures a seamless experience. The web application, fortified by blockchain technology, stands as a beacon of hope in India's fight against drug abuse, offering a transformative approach that respects the country's unique cultural context. It empowers individuals, ensuring their privacy while fostering community engagement and overcoming the pervasive stigma surrounding addiction.

Keywords—Blockchain technology, whistleblowers, token to coupon conversion.

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Intelligent Disease Prediction in Hydroponic Systems Using Machine Learning

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***Abstract*—**Hydroponics is the soil-less agriculture farming, which consumes less water and other resources as compared to the traditional soil-based agriculture systems. However, monitoring hydroponics farming is a challenging task due to the simultaneous supervising of numerous parameters and plant diagnosis system. Therefore, this article focuses on the implementation of web application integrated machine learning-based smart hydroponics expert system. The proposed project with IoT consists of three phases, where the first phase implements hardware environment equipped with real-time sensors such as pH, temperature, water level, and camera module which are controlled by Raspberry Pi processor. The second phase implements the CNN Model for plant disease detection and classification and the system includes a chat bot for user interaction, addressing plant-related questions and providing details about any detected diseases. In the third phase, farmers can monitor the real-time sensor data using AWS TwinMaker and plant leaf disease status using an web-based application. In this manner, the farmer can continuously track the status of his field using the mobile app. Through this innovative approach, hydroponic farming can become more efficient, sustainable, and ultimately contribute to addressing global food security challenges.

Keywords—Digital Twin, CNN, Raspberry Pi

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MediConnect - Remote Patient Health Monitoring

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***Abstract*—**In this country, hundreds of thousands of old people are isolated from society and lonely as an outcome of urbanization and shifting family arrangements. They highlight the need for more mental health care, community outreach, and programs to identify and help those who are susceptible. The term" lonely death" describes a person dying alone, frequently with no one around to see or be there in their last moments. This might occur as a result of social isolation, health problems, financial difficulties, or other factors. The emotional and social ramifications of these deaths highlight how important it is to avoid isolation and make sure that everyone has access to the care and assistance they require. Our project's objectives are to keep an eye on the patient's condition and identify any collapses, falls, or abrupt changes in heart rate. Additionally, it helps the user and notifies the authorities in an emergency or in case of discomfort by sending alerts.

Keywords—Internet of Things (IoT), Cloud computing, Remote patient monitoring, Patient data analysis

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Comparative Analysis of Text Classification Models for Offensive Language Detection on Social Media Platforms

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***Abstract*—**The detection of offensive language in text has become increasingly crucial in various social media platforms to maintain a respectful and safe environment. In this research we study and present a comparative analysis of different text classification models for identifying offensive and non-offensive language. Specifically, we investigate the performance of Support Vector Classifier (SVC), Compliment model, Gaussian model, and Multinomial model on a dataset curated for this purpose. Each text classification model is implemented and trained using the preprocessed dataset, and their performance is evaluated using standard evaluation metrics such as accuracy. The experimental results display the effectiveness of each model in distinguishing offensive language from non-offensive language. This research contributes to the literature by providing empirical evidence on the performance of various text classification models for offensive language detection, thus aiding in the development of more robust and accurate detection systems for online platforms.

Keywords—Text classification, Offensive language detection, Support Vector Classifier (SVC), Compliment model, Gaussian model, Multinomial model, Social media platforms, Empirical analysis, Performance evaluation, Online content moderation

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Wearable Technology for Driver Monitoring and Health Management: A Comprehensive Survey

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***Abstract*—**In recent years, the focus on driver health and its impact on road safety has intensified. Exploring the integration of wearable technology in driver monitoring and health management, this paper presents a synthesis of literature surveys on innovative approaches and significant findings. It covers diverse studies, including real-time physiological response assessment using smartwatches, stress detection utilizing wrist-worn sensors, and the monitoring of cardiovascular health. Additionally, breakthroughs such as real-time vehicle-embedded heart health monitoring systems and multi-sensor-based driver health symptom detection are discussed. The potential of smart wearables, notably smartwatches, in proactive health management is elucidated. Furthermore, the paper highlights the emerging trends in the field, such as the use of machine learning algorithms for analyzing wearable sensor data and improving predictive capabilities. The findings underscore wearable technology's pivotal role in enhancing road safety, accident prevention, and healthcare through continuous monitoring and early detection of health-related issues. This paper contributes insights into leveraging wearable technology for driver safety and health management, offering valuable directions for future research and development in the domain.

Keywords—Driver Health, Road Safety, Wearable technology, Accident mitigation, Driver Safety, Drowsiness detection

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Wise Care: A Comprehensive Mobile Application with Conversational Chatbot and Medical Assistance

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***Abstract*—**In a rapidly changing society, seniors often face loneliness and health concerns as younger generations seek opportunities elsewhere. To address these challenges, our app introduces a unique chatbot feature that interacts with users through chat, providing a personalized and compassionate companion. The chatbot not only addresses loneliness through engaging conversations but also delivers intelligent medical assistance by offering personalized advice and remedies based on user expressed symptoms. In addition to this, our app also provides a range of other functionalities such as booking medical consultations, accessing counseling services, and ordering prescriptions to offer comprehensive support. With its user-friendly design and cutting-edge technology, our app sets a new standard for scalable solutions that cater to the unique needs of aging populations, fostering healthier and more connected lives for seniors globally.

Keywords—Chatbot, Health, Loneliness

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Survey of Strabismus Detection Techniques

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***Abstract*—**Strabismus, or "crossed-eyes," is one of the most common ocular diseases. Strabismus has a serious impact on human life. Patients with strabismus not only have visual but also psychological and social effects from their condition. In adults, one study showed that large-angle horizontal strabismus could affect one's ability to gain employment. This appeared to be more important for women's employability than men. These psychosocial effects may be influenced by whether the degree of ocular misalignment is detectable by those with whom they have contact. If the strabismus is not detectable, presumably the observers' negative feelings for strabismus would not be invoked. As a result, a timely strabismus screening becomes important and essential for preventing strabismus. So far, there are multiple ways to complete strabismus screening. Traditional strabismus screening is conducted manually by ophthalmologists through many tests, such as the cover and uncover test, prism cover test and the Hirschberg test. The proposed method uses a frontal facial image from a patient, and it measures the deviation of the positional similarity of two eyes within the image, which aims to provide ophthalmologists with interpretable information for the diagnosis of strabismus.

Keywords—Strabismus Detection, Convolutional Neural Network, K-Nearest Neighbors, Support Vector Machine

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AI Based Multi Robot Fire Suppression System

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***Abstract*—**Imagine a groundbreaking shift in how we tackle fires – we're bringing in a team of really clever robots. These high-tech marvels come with amazing sensors and smart artificial intelligence. They work together seamlessly, using fancy algorithms to quickly spot and stop fires with incredible precision. It's not just about having cool technology; it's a whole new approach to handling emergencies, changing how we ensure safety and efficiency. These futuristic robots aren't just adaptable; they're super smart, responding rapidly to all sorts of fire challenges. Picture a constant, watchful presence of these robotic pals, their collective brilliance and smooth teamwork not just transforming firefighting but also paving the way for exciting progress in a whole new way.

Keywords— Sensors, Slam, Servers

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IoT-Based Smart Aquaponics System with Remote Monitoring and Actuator Control

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***Abstract*—**This innovative aquaponics system integrates automation to streamline the cultivation of plants and fish in a sustainable, symbiotic environment. We focus on developing an application for the automation and real-time water quality monitoring. The system incorporates an automatic water transfer system and feeding mechanism that optimizes nutrition delivery to the fish, ensuring their health and growth. Simultaneously, real-time water quality parameter monitoring guarantees a stable and conducive aquatic environment. This automation not only reduces the labor-intensive aspects of aquaponics but also improves the overall efficiency and productivity of the system, making it a promising solution for sustainable food production.

Keywords*— *Aquaponics, Aquaculture, Hydroponics, Ammonia, pH, Agriculture, IoT, Arduino Uno, ESP32, ThingSpeak, Flutter, Dart, Node.js.

Detection of Autism Spectrum Disorder in Toddlers using Machine Learning

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***Abstract*—**The aim of this study is to identify toddlers at risk for Autism Spectrum Disorder (ASD) early on by developing a web-based tool that uses the machine learning method logistic regression. Our approach emphasises the vital need of early intervention because it recognises the lifelong impact of ASD on language development, speech, cognitive, and social skills, especially when symptoms appear during the first two years of life. Respondents to nominal questions are asked to provide a score that indicates the probability of Autism Spectrum Disorder. Using toddler datasets, our study demonstrates the efficacy of logistic regression in producing precise predictions with little characteristics. The study contributes to the larger objective of improving the diagnostic process by highlighting the importance of early discovery in reducing the long-term impacts of ASD. Crucially, this method is presented as a quick and affordable substitute for clinical testing, providing an invaluable tool for enhancing diagnostic accuracy in cases with toddler ASD.

Keywords—Autism Spectrum Disorder, Logistic Regression, Machine Learning, Early Detection, Toddler Diagnosis.

An Idea Sharing and Validation Platform Using Blockchain with Delegated Proof of Contribution (DPoC)

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***Abstract*—**This research proposes a novel approach to building an idea sharing and collaboration platform empowered by blockchain technology and the Delegated Proof of Contribution (DPoC) consensus mechanism. Ideas submitted to the platform undergo rigorous validation using specialized algorithms and Natural Language Processing (NLP) techniques to ensure authenticity and quality. Validated ideas are then tokenized on the blockchain, with each idea assigned a unique token serving as proof of ownership. Users can submit problem statements, and the platform matches them with relevant ideas, facilitating collaboration or ownership transfer. Additionally, users have the flexibility to list their ideas publicly or keep them private. The platform incentivizes active participation and contributions through DPoC, rewarding users for valuable ideas and collaborations. By combining blockchain technology with DPoC, the platform aims to foster efficient idea sharing, collaboration, and problem-solving, promoting decentralization, transparency, and incentive-driven engagement.

Keywords—Idea Sharing Platform, Blockchain, Delegated Proof of Contribution, Validation Algorithms, Natural Language.

A Review on Integrating IoT and Robotics for Improved Care

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***Abstract*—**This research paper explores an innovative approach at the intersection of healthcare, Internet of Things (IoT), and advanced robotics, focusing on the concept of the Internet of Robotic Things (IoRT). Envisioning a future where synchronized autonomous robots collaborate to undertake specialized medical tasks without direct human intervention, this paradigm represents a significant leap forward in healthcare delivery and remote medical assistance. The paper delves into the comprehensive system comprising patient monitoring robots, coordinating robots, assistant robots, and a centralized management platform, analyzing its transformative potential and implications for the healthcare landscape. By leveraging IoT integration and advanced robotics, the research aims to enhance patient care, improve medical processes, and democratize access to specialized medical services. This approach not only addresses critical healthcare needs but also ensures real-time monitoring, remote interventions, and cost-effectiveness while prioritizing data privacy and security. Overall, this pioneering endeavor promises precision, efficiency, and enhanced accessibility in medical treatments, reshaping the future of healthcare delivery.

Keywords—Robotics, IoMT, cybersecurity

Exploring the Evolution of Software Engineering with Generative AI

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***Abstract*—**This paper delves into the transformative impact of Generative AI on the field of Software Engineering, tracing its evolution and exploring the novel possibilities it presents. By examining the intersection of AI and software development practices, this study sheds light on how Generative AI tools are revolutionizing traditional methodologies, enhancing productivity, and fostering innovation in software design, development, and maintenance. Through a comprehensive analysis of current trends, challenges, and future prospects, this research illuminates the profound implications of integrating Generative AI into software engineering workflows, paving the way for a new era of intelligent software development.

Keywords—Generative AI, Software Engineering, Evolution, Innovation, Productivity, Intelligent Software Development, AI Tools, Software Design, Development Methodologies.

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A Crowd Monitoring and Real-Time Tracking System using CNN

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***Abstract*—**In response to the ever-evolving landscape of security concerns, the project endeavors to fortify public safety through an innovative surveillance system called SECURE SPHERE. The system strategically places cameras to continuously monitor crowd behavior, employing cutting-edge algorithms to detect abnormalities, such as attacking, fighting or the presence of weapons. Upon identification of anomalies, alerts are promptly transmitted to law enforcement agencies through an intuitive and user-friendly application. A distinctive feature of the project lies in its real-time tracking capability, allowing for the monitoring of a culprit's movement captured on any of the strategically positioned cameras. The proposed innovation significantly enhances the system's efficacy in providing precise and actionable information to law enforcement, thereby bolstering efforts to ensure public safety. The heart of this initiative lies in the Application Interface, providing law enforcement with an accessible and user friendly platform. The interface not only enables the viewing of alerts but also grants access to the invaluable real-time tracking feature. The integrated approach to public safety envisioned in the project ensures that law enforcement agencies are equipped with the essential tools and information needed to respond swiftly and effectively to incidents. By seamlessly combining continuous crowd monitoring, anomaly detection, real-time tracking, and user-friendly interfaces, the project strives to create a safer environment for the public. The comprehensive surveillance system, with its advanced technology and integrated features, not only serves as a proactive measure but also contributes to the creation of a secure and resilient societal environment.

Keywords—Abnormal Activity, Convolutional Neural Network

A Malayalam Cancer Question Answering System

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***Abstract*—**This paper introduces "MediKnow," a pioneering Malayalam Question Answering System designed to address the scarcity of generative answer works in the realm of healthcare information accessibility, specifically tailored for cancer-related queries. The dearth of such systems in Dravidian languages, particularly Malayalam, has motivated the development of a robust solution. Leveraging advanced Natural Language Processing (NLP) techniques, including OpenAI models and FAISS for efficient vector storage, MediKnow employs a specialized Malayalam language model to navigate the intricacies of the Dravidian linguistic context. The processing pipeline encompasses document loading, text splitting, and embeddings, enhancing the system's capacity to comprehend and accurately respond to a diverse range of cancer-related questions. This work underscores the critical need for bridging the gap in generative answer works for Dravidian languages, highlighting the specific challenges posed by the Malayalam language due to its complexity. Beyond providing accessible information, MediKnow exemplifies the efficacy of employing state-of the- art NLP technologies to address linguistic nuances. The paper evaluates the system's performance on a dataset of cancer-related questions, demonstrating its ability to deliver accurate and informative answers. The innovative approach presented herein contributes to the advancement of NLP capabilities in non-English languages, particularly focusing on healthcare-related information retrieval. The development and deployment of "MediKnow" signify a significant stride in tackling linguistic and domain-specific challenges in cancer related question answering, ultimately making critical healthcare information more accessible to Malayalam speakers.

Keywords—Natural Language Processing, Question Answering System, Dravidian Languages, Cancer Information, OpenAI, Faiss.

Indian Sign Language Recognition Using Yolov5

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***Abstract*—**In our rapidly advancing technological era, characterized by the ubiquity of home automation and a demand for streamlined solutions, a project unfolds with the mission to address communication challenges for individuals with hearing and speech impairments. Sign language, a vital mode of expression for the deaf and mute, forms the focal point of this initiative. Utilizing sophisticated Deep Learning algorithms including YOLOv5 the project aims to analyze and interpret sign language gestures from input images. The ultimate goal is to seamlessly translate these gestures into text and, subsequently, into audio, thereby providing an encompassing communication solution. A diverse dataset, encompassing English letters, numbers, and words, enhances the system's proficiency. This endeavor not only embraces technological progress but, more importantly, champions inclusivity by breaking down communication barriers for those who have long faced challenges in expressing themselves effectively.

Keywords—YOLOv5, ISL, Words Recognition, Static Gesture Recognition

Unlocking Emotion Recognition in ASD Children: Analyzing Facial Expressions

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***Abstract*—**Children with Autism Spectrum Disorder (ASD) often face challenges in understanding and expressing emotions, which can hinder their social interactions and emotional development. This paper presents a study on using technology for emotion recognition in children with Autism Spectrum Disorder (ASD). We collect facial expression data from ASD children during different emotional states and apply machine learning to accurately identify emotions. Our results show high accuracy, indicating the potential for non-invasive, technology based emotional support and intervention for ASD children. This research emphasizes the importance of multidimensional data in understanding emotions in ASD and offers promising prospects for personalized interventions.

Keywords—Autism Spectrum Disorder (ASD), Emotion Recognition, Technology-based Intervention

Unveiling Stress through Facial Expressions: A Literature Review on Detection Methods

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***Abstract*—**Stress detection is crucial in various fields, including healthcare, human-computer interaction, and automotive safety. This paper presents a comprehensive comparison study of three emotion detection modules: facial expression analysis, eye blink count, and eyebrow movements. The aim is to assess their effectiveness in detecting stress accurately. Each models is evaluated based on its ability to discern stress levels in real-time scenarios. By analyzing the data collected from different research papers related to stress-inducing stimuli, we provide insights into the strengths and limitations of each model. Additionally, we propose a novel framework that integrates these modules to enhance stress detection accuracy. The results indicate promising performance, with the integrated framework demonstrating superior stress detection capabilities compared to individual modules. This research contributes to advancing stress detection methodologies, paving the way for more reliable and efficient stress management systems.

Keywords—Convolutional Neural Network, Eye aspect ratio

Automated Voice-Controlled PowerPoint Presentation Generation System from Voice/Text Prompts

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***Abstract*—**Users interact with the system via text or voice, specifying the presentation topic. The system employs NLP to analyze the input, extracting main points and supporting details. Utilizing this analysis, it generates PowerPoint slides, each focusing on specific aspects of the topic and incorporating text, images, or other visuals. After generation, users are given the option to download the PowerPoint or view it as a slideshow. During the slideshow, navigation is facilitated through arrow keys or voice commands, offering users flexibility in accessing and presenting the content.

Keywords—NLP, Powerpoint Generation, Text Generation, Image Generation

Personality Profiling Using CV Analysis

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***Abstract*—**Human personality has been crucial to the growth of both organizations and individuals. Standard questionnaires and Curriculum Vitae (CV) analysis are two methods used to assess human personality. So, a personality prediction system that combines CV analysis and MBTI model questionnaires to accurately predict an individual's personality traits based on their uploaded CV is introduced. The system utilizes advanced Natural Language Processing (NLP) techniques to extract relevant information from the CV, including work experience, education, skills, and achievements. By analysing the textual content, the system identifies keywords and phrases associated with different personality traits, laying the foundation for precise predictions. MBTI model questionnaires are integrated to further enhance the accuracy of personality prediction. User responses to the questionnaires are carefully analysed and mapped to the corresponding personality traits using established psychological theories and models. A machine learning algorithm is then employed to create a predictive model, learning from a pre-labelled dataset of CVs and their associated personality traits. The system's performance is evaluated using metrics such as accuracy and precision, ensuring its effectiveness in capturing the nuances of individual personality traits. The developed system has significant applications in recruitment and team composition, aiding employers in making informed hiring decisions by evaluating candidates whose personalities align with specific job requirements. Additionally, individuals can benefit from gaining insights into their own personality traits, enabling them to make informed career choices and pursue tailored personal development opportunities. Overall, the proposed system provides an efficient and accurate approach for personality prediction based solely on CV analysis and questionnaire responses.

Keywords—Personality prediction, CV analysis, MBTI model, NLP, Machine Learning, Recruitment, Team Composition

Human Immunity Gainer (HIG)

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***Abstract*—**The Human Immunity Gainer represents a pioneering biomedical instrumentation system focused on enhancing immunity through the analysis and stabilization of cell voltages within the human body. By leveraging advanced technology, this system meticulously examines internal cell voltages to gain insights into the functioning of the immune system. Unlike traditional diagnostic approaches, The Human Immunity Gainer goes a step further by actively intervening to address voltage fluctuations. Through the use of an external power supply, it harmonizes with the body's natural processes to stabilize voltage variations and implement necessary corrections. This abstract invites readers to delve into the synergy between innovative biomedical engineering and human well-being, ushering in a new era of proactive immune system enhancement with The Human Immunity Gainer.

Keywords—Immunity, Immune System , minerals, Cell Voltage, Health, Wellness, Voltage Regulation, Health Care, Nerve Cells.

AI Enabled Robot for Data Collection in Unreachable and Extreme Environments

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Abstract - This article outlines a groundbreaking approach to gathering data in hazardous or inaccessible environments through the utilization of innovative robotics. These robots are specifically designed to navigate and collect vital information from areas too dangerous or remote for human exploration, enabling unprecedented research opportunities. Central to this advancement is the integration of artificial intelligence (AI) support within drones, endowed with human recognition capabilities . By analyzing live drone footage using advanced pattern recognition techniques like YOLO (You Only Look Once), these drones achieve high-precision, real-time human detection. Equipped with an array of sensors, including cameras and GPS tracking systems, these autonomous robots are poised to revolutionize data collection and analysis in challenging environments. The proposed drone system represents a state-of-the-art solution to object detection challenges in harsh settings. By amalgamating cutting-edge technologies such as GPS tracking, obstacle avoidance, altitude holding features, and the YOLOv8 algorithm, this system offers unparalleled real-time monitoring and situational awareness capabilities. Leveraging GPS monitoring for efficient object localization and the YOLOv8 algorithm for quick and accurate detection, coupled with the drone's adeptness at navigating difficult terrain and maintaining stable flight, ensures consistent and dependable video feed quality. Moreover, a comprehensive strategy is employed to enhance safety by mitigating potential hazards while simultaneously boosting operational efficiency.

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This drone system holds promise for the delivering of the exceptional performance and invaluable insights in the face of challenging circumstances, whether deployed for environmental monitoring, surveillance missions, or search and rescue operations. The methodology for object detection using YOLOv8 involves a series of steps including pre-processing the input video, running the object detection model, initializing object post-processing, detecting objects over the frame, periodically re-detecting objects, and visualizing the results. Testing was conducted using the COCO dataset, which encompasses various lighting conditions, with datasets divided into testing, validation, and training categories to ensure robust performance evaluation. Photos with a resolution of 640 × 640 were utilized for experimentation, underscoring the efficacy of the proposed approach in addressing object detection challenges across diverse environmental conditions.

Keywords—YOLOv8, UAV, python, Flask, Computer vision, AI.

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Chatbot-Enabled Symptom Assessment: Revolutionizing Disease Diagnosis and Patient Care

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***Abstract*—**The field of healthcare has witnessed remarkable advancements in recent years, driven by the integration of cutting-edge technologies into traditional medical practices. One such innovation that has garnered significant attention is the development of chatbots, powered by advanced natural language processing (NLP) and machine learning techniques. These chatbots have proven to be valuable tools for enhancing the diagnostic process by engaging in conversations with patients, extracting essential information about their physical symptoms, and even assessing their emotional well-being. This paper introduces an innovative web application called CareConnect: Empowering Health Enhancing Care, that harnesses chatbot technology to efficiently assess symptoms and analyze patient emotions. By engaging in conversations with patients, chatbots extract critical information about physical well-being and

emotional states, transforming this data into comprehensive reports for evaluation and diagnosis by medical professionals.Through this integration of technology and healthcare expertise, our system not only enhances patient access to medical advice but also highlights the transformative potential of AI-driven tools in early and accurate disease diagnosis.

Keywords—Chatbots, Natural Language Processing (NLP), Medical Data Analysis, AI-Driven Diagnostics

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Advancements in Assistive Technologies: Enhancing Independence and Accessibility for the Visually Impaired

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Abstract **-** This research paper explores the transformative role of technology in improving the lives of visually impaired individuals. In an increasingly digital world, access to information and navigation of daily tasks present significant challenges for the visually impaired. However, advancements in assistive technologies offer promising solutions to address these barriers and enhance independence and accessibility. Through an examination of various technologies, including screen readers, navigation apps, object recognition software, wearable devices, and smart home technology, this paper highlights the diverse range of tools available to empower visually impaired individuals in navigating their surroundings, accessing digital content, and performing daily tasks. Additionally, it discusses the impact of these technologies on education, employment, and social inclusion for the visually impaired community. By promoting greater awareness and adoption of assistive technologies, this research underscores the importance of innovation in fostering inclusivity and improving the quality of life for visually impaired individuals. Through ongoing research and collaboration, the potential for further advancements in assistive technologies remains promising, paving the way for a more accessible and equitable future.

Keywords— Assistive technology, Braillie display, Augmented reality, Navigation assistive system, smart guiding glasses(SGG)

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Face Image Synthesis

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***Abstract*—**Facial image synthesis has made rapid dynamic progress with the fast expansion of deep learning techniques. Reference samples can give complete primary information about texture and content in this job and improve the visual quality of synthetic images. A normalized network with a multi-scale pyramid structure is used in this instance. The dual-channel normalization architecture at the center of the normalization network is capable of obtaining previous knowledge about various semantics from reference samples. There are two conditional normalization branches in the DNC specifically. Through the first branch, the reference image can be spatially adaptively normalized based on the input image's semantic mask. The second branch is used to normalize the adaptive representation of the modified input image on the reference image. By dividing the complete cross-domain mapping into two branches, DNC may highlight the distinct significance of structural and spatial elements. To avoid information redundancy and improve the final performance, the Gated Channel Attention Fusion module is used to differentiate and merge useful information from the two branches. This generated synthetic image is then compared with photos of criminals in the crime database. If a match is found, the image will be displayed along with details about that criminal. Comparing the images is done by using pillow library with image hashing.

Keywords—Double Channel Normalization network, Gated Channel Attention Fusion, Semantic mask, Spatially-adaptive normalization, Adaptive instance normalization.

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Directio-AR Assisted ShopMate

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Abstract **-** In the expansive aisles of hypermarkets, locating specific products often proves challenging, leading to impulsive purchases and budgetary oversights. This app emerges as an innovative solution, combining augmented reality technology with machine learning to transform the shopping experience. The application features an AR way point using ARcore that shows the route to be taken to help the users in locating specific products efficiently within the supermarket. Customers follow the AR way point, effortlessly finding their desired items, enhancing their shopping experience. Upon reaching products the products are identified using real time object detection using YOLO model. After detecting the products using object detection the app provides information tabs displaying vital details like specifications, prices, ingredients, nutritional contents etc. The app promotes mindful spending by integrating a dynamic cart feature, allowing real-time expenditure tracking to ensure adherence to budget constraints. The system redefines grocery shopping, empowering customers with precise guidance, informed choices, and a more efficient and enjoyable retail experience.

Keywords—Augmented Reality, ARcore, Object Detection, YOLO

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Stockwise: A survey on stock price prediction models

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***Abstract*—**Stock prices are difficult to predict because they can change a lot and are affected by various factors. People, especially investors, care a lot about predicting them accurately. By properly predicting stock prices, it is very useful to those investors who invest in the stock market to get profit. There are plenty of machine learning and deep learning models available for prediction. Some of the models predict very accurately, and others do not. So, the selection of a prediction model is an important factor for predicting the stock price. This paper mainly focuses on comparing different prediction models based on performance measure.

Keywords—RNN, LSTM, RMSE, ARIMA, GAN

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Hydro Sense: Empowering Water Quality Monitoring Through IoT

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***Abstract*—**Clean water is an essential resource in sustaining life, and ensuring the quality of drinking water is crucial for promoting the wellbeing and health of individuals. Water quality monitoring systems are essential for evaluating and guaranteeing the safety of water sources. The current water quality surveillance system lacks real-time information, which is a drawback. Manually checking water quality continuously is impractical. To address this issue, we have developed a cost-effective live-stream water quality monitoring system specifically for consumable water. Key factors such as turbidity, Ph and temperature need to be measured to detect contaminants and prevent water-related illnesses. Our system includes specially designed sensors connected to a microcontroller with an integrated ADC circuit for signal conversion, data processing, and analysis. The hardware component is connected to the main system via a USB cable. The system displays the values of each parameters in the Blynk console and when values are manually given to the trained model it will predict if the water is in consumable form or not. We have trained the model using the Random Forest classification Algorithm to predict if the water is consumable or not.

Keywords—pH sensor, turbidity sensor, temperature sensor, ESP32, machine learning, Random Forest classification Algorithm

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A Review of Load Estimation and Distribution Strategy for Renewable Energy Sources

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***Abstract*—**The remarkable increase in per capita power consumption worldwide has drawn attention towards the needed growth in renewable energy sector in order to bridge the gap between overall demand and supply. In this project various renewable energy sources like solar, wind and hydro energy are taken into consideration for the load estimation. Several factors are considered for the making of dataset related to each energy source which include environmental factors as well as other supporting factors. With the collected data, prediction of energy generation is performed using the machine learning algorithm, Random Forest. The generation, transmission and distribution of the energy is achieved through a power grid system which enables efficient and reliable supply of electrical power from power plants to various consumers. Bidding mechanisms are commonly used in renewable energy markets to allocate and trade energy generated from renewable sources. Producers, such as solar farms or wind power facilities, participate in bidding processes to sell their energy to different distribution centres through grid. Bids may include details like the quantity of energy, pricing, and timing of delivery.

Keywords—Renewable energy integration, machine learning algorithms, power spot market bidding, block chain-based energy market, solar energy profiles.

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FaceVue: A Review For Dynamic Advertising And Cost Management System

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***Abstract*—**This project aims to develop an advanced smart billboard platform, integrating cutting-edge technologies like machine learning and artificial intelligence. The primary focus is on creating a sophisticated system capable of precise face recognition, gender identification, and age estimation within promotional content. The initial phase has successfully implemented a resilient face detection system, complemented by accurate gender identification and age recognition models. These models lay the foundation for a nuanced understanding of the audience interacting with advertisements, providing businesses with valuable insights for targeted marketing. Moving forward, the project aims to seamlessly integrate these models into a user-friendly smart billboard system. Rigorous testing has validated the effectiveness of these models across diverse datasets and real-world scenarios. The upcoming stages involve optimizing for real-time processing, ensuring robust privacy and security measures, and introducing an adaptive ad queue algorithm. This algorithm dynamically tailors advertisements based on the identified audience, empowering businesses to enhance the personalization and impact of their advertising campaigns. The project's overarching goal is to revolutionize traditional marketing strategies by offering insights into viewership patterns, campaign impact, and audience demographics, marking the beginning of a journey toward reshaping the advertising landscape.

Keywords— DBCFace, Multi Camera Face Detection and Recognition, YOLOv

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PulseSync: IoT-Enabled Monitoring and Predictive Analytics for Healthcare

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***Abstract*——**PulseSync, an advanced IoT-driven healthcare system, employs wearable sensors to monitor vital signs like heart rate, blood pressure, and oxygen saturation in real-time. Its cloud-based storage ensures secure data accessibility for clinicians. Notably, PulseSync integrates machine learning to predict diabetes risk, facilitating timely interventions. Clinicians benefit from a user-friendly interface on the PulseSync website, offering immediate alerts for abnormal vital signs and enabling trend analysis. The website of PulseSync also provides real-time vitals of patients, while the dedicated mobile app empowers individuals and caregivers with direct access to vital data, fostering a proactive approach to health management. The app offers real-time vitals of the particular patient, aiding in continuous monitoring. The system's predictive analytics for diabetes is grounded in advanced data analytics and algorithmic modeling, enabling clinicians to develop personalized and preemptive strategies. PulseSync's real-time data access and predictive capabilities are poised to redefine healthcare delivery, enabling early intervention and personalized preventive measures. This transformative healthcare experience extends to patients, making them active partners in their well-being journey. PulseSync encapsulates the evolving landscape of patient-centric, data-driven healthcare solutions.

Keywords— Remote Health Monitoring Systems(RHMS), Decision Support System(DSS)

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Detection of Diabetic Retinopathy and Glaucoma using Deep Learning

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***Abstract*—**Advancements in medical technology continue to reshape the landscape of eye care, particularly in the early detection and management of diabetic retinopathy and glaucoma. This abstract outline a novel approach aimed at optimizing disease identification and treatment through the integration of deep learning models and cutting-edge image processing techniques. Our primary goal is to enhance the accuracy and efficiency of diagnosing these prevalent eye conditions, which if left untreated, can lead to severe vision impairment and even blindness. By harnessing the power of advanced algorithms and image analysis tools, this initiative aims to provide healthcare professionals with a comprehensive platform for proactive disease monitoring and personalized treatment strategies. The proposed system will enable the prediction of disease progression and outcomes, facilitating timely interventions tailored to individual patient needs. Through this proactive approach, we anticipate a significant reduction in the societal and economic burden associated with diabetic retinopathy and glaucoma. This project is poised to revolutionize eye healthcare by shifting the focus towards preventative measures and individualized care plans. By empowering clinicians with accurate predictive tools, we aim to improve patient outcomes, minimize vision loss, and ultimately transform the way these debilitating eye diseases are managed and treated. The integration of deep learning and image processing technologies represents a critical step towards achieving these ambitious healthcare goal.

Keywords— medical technology, diabetic retinopathy, glaucoma, treatment optimization, proactive disease monitoring, disease progression, societal burden, individualized care plans, transformative healthcare, image processing technologies

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Driving Agricultural Innovation: A Review of Technological Advancements in Smart Farming

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***Abstract*—**This review paper comprehensively analyzes technological advancements propelling the transition to smart farming in agriculture. Drawing from fifteen seminal studies, it explores the integration of IoT devices, AI, robotics, and blockchain to revolutionize agricultural practices. From real- time crop monitoring to predictive analytics for resource management, these technologies offer opportunities to boost productivity, reduce waste, and enhance sustainability. The paper highlights key trends, applications, and implications, while also addressing challenges like infrastructure access and data privacy concerns. By shedding light on technology's transformative potential in agriculture, this paper aims to inform stakeholders, policymakers, and researchers about adopting smart farming solutions for a resilient and efficient agricultural ecosystem.

Keywords—Smart agriculture, Internet of Things (IoT), Artificial Intelligence (AI), Smart Farming.

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An Integrated Approach to Campus Water Management: Leveraging Wireless Automation and Advanced Virtual Leakage Auditing

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Abstract: This research paper presents the design and implementation of a Campus Wireless Water Management Automation System (CWWMAS) integrated with existing plumbing architecture and building patterns. The system utilizes data from pumping activities, such as those occurring in hospitals, schools, hotels, and other campus facilities, to detect potential leaks through the analysis of pumping cycles. By considering factors such as the timing of water usage and fluctuations in pumping activity during working hours, the system employs advanced virtual leakage audit provisions to identify and mitigate potential leaks in real time. This paper outlines the architecture, components, and operation of the CWWMAS, along with its benefits and potential applications in campus water management.

Keywords—Wireless Water Management, Automation System, Plumbing Architecture, Building Patterns, Leakage Detection, Virtual Audit

A SURVEY ON E-VOTING SYSTEMS USING BLOCKCHAIN

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Abstract— In the digital age, traditional voting systems are increasingly facing challenges related to security, transparency, and accessibility. To address these issues, blockchain technology has emerged as a promising solution, offering a decentralized, tamper-proof, and transparent platform for electronic voting (e- voting). This survey paper provides a comprehensive analysis of the existing literature on blockchain-based e-voting systems, examining the challenges, opportunities, and future directions in this rapidly evolving field. We review different blockchain architectures highlighting their strengths and limitations. Through a systematic examination of existing solutions and case studies, we identify emerging trends and best practices in the design and implementation of blockchain-based e-voting systems.

Keywords—Blockchain, cryptography, e-voting, smart contracts.

Crop Recommendation System using Machine Learning and IoT

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***Abstract*—** In many regions across the globe, agriculture re- mains the cornerstone of livelihoods, with a significant portion of the population relying on it as their primary occupation. The suc- cess of agricultural endeavors hinges greatly on crop production, making it a crucial aspect of sustenance and economic stability. To address the challenge of ensuring optimal crop yields, a cutting-edge solution integrating IoT (Internet of Things) and ML (Machine Learning) technologies has emerged. This innovative system employs sensor-based soil testing to meticulously assess soil conditions, thereby mitigating the risk of soil degradation and fostering healthy crop growth. A variety of sensors are deployed within this system, each tasked with monitoring specific soil parameters essential for crop health. These sensors include those for measuring soil temperature, moisture levels, pH balance, and nutrient composition (NPK). By continuously gathering data on these crucial factors, the system builds a comprehensive understanding of soil dynamics. The collected data is then transmitted to a microcontroller, where it is subjected to rigorous analysis utilizing sophisticated machine learning algorithms such as random forest. Through this analytical process, the system generates actionable insights and recommendations tailored to optimize crop growth conditions. Ultimately, this integrated IoT and ML system represents a groundbreaking approach to agricultural management, empowering farmers with real- time, data-driven guidance to enhance crop productivity and sustainability

Index Terms—Iot, Machine learning, Crops, Sensors

Dynamic Traffic Light Control: A Novel Approach for Congestion Mitigation and Traffic Optimization

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***Abstract*—**In cities, traffic congestion is a major problem that negatively affects both the quality of life and the effectiveness of transportation. To tackle this difficulty, we introduce a unique method for dynamic traffic signal regulation that takes waiting time and vehicle density into account. Our approach makes use of cutting-edge technology including Raspberry Pi for hardware integration, YOLOv8 and CUDA for vehicle detection, and SUMO for traffic simulation. Using SUMO, we first create a 2D map of a traffic scenario as input for further analysis. Next, we utilize YOLOv8 and CUDA to identify automobiles inside the simulated setting, allowing us to compute vehicle density by taking into account the number of vehicles and the length of the road. Congestion status is evaluated using a predetermined threshold value that was established by trial and error. To efficiently regulate traffic flow, traffic lights are dynamically turned green when the density is over the threshold, signaling congestion. However, there is a 30-second waiting period. Our algorithm's output is smoothly connected with hardware through the use of a Raspberry Pi, which manages traffic light modules to instantly make modifications. This integration makes it easier to regulate traffic signals effectively, which guarantees optimal traffic flow and reduces congestion. Our test findings show how well our method works in different lanes to optimize traffic flow and lessen congestion. Our technology presents a prospective option for enhancing urban traffic management and transportation efficiency by dynamically modifying traffic lights based on real-time data.

Keywords-CUDA,SUMO

Intrusion Countermeasure System

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***Abstract*—**The project titled "Intrusion Countermeasure System" presents an innovative solution aimed at enhancing security measures in restricted areas through the prevention of unauthorized access and trespassing. Leveraging cutting-edge technologies such as Intrusion Countermeasure System and mobile robotics, this system integrates multiple components to achieve its objective. Machine learning algorithms, powered by OpenCV, are utilized for motion capture and face detection, enabling accurate recognition and response to human presence. On the hardware front, the system employs Arduino for robust control, along with motors, motor drivers, and cameras to facilitate seamless operations. The integration of ROS2 SLAM (Simultaneous Localization and Mapping) and navigation further enhances the system's capabilities, allowing for real-time mapping and autonomous navigation within the secured environment. The result is a comprehensive defense system that not only identifies potential intruders but also takes swift and intelligent action, thereby fortifying security in sensitive areas. This project exemplifies the potential for advanced technology to redefine security measures and safeguard critical locationseffectively.

Keywords—Intrusion Countermeasure System, Machine Learning, Mobile Robotics, Open CV

Cybersecurity Challenges and Solutions in Edge Computing for IoT

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Abstract—As the field of Internet of Things (IoT) continues to expand, it has created a newly connected environment, transforming physical objects that surround us into an ecosystem of information that is rapidly changing the way we live. Meanwhile edge computing architectures have introduced a new decentralised approach to computing by bringing the services closer to the data source and offering better performance and more security than traditional cloud centric IoT architectures. So, in this research paper, we discuss what exactly comprises an Internet of Things architecture. We will analyse the changes that edge computing brings about to the table. We will also explore how these architectures can be integrated to design better IoT solutions for society and industry.

Keywords—RISC, Vivado 18.3, ALU, MAC, Vedic Mathematics

An In-Depth Investigation of the Emerging Role of Electrocoagulation in Cutting-Edge Wastewater Treatment Practices

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Abstract— Electrocoagulation (EC) has appeared as a promising and sustainable technology for the treatment of various water sources contaminated with diverse pollutants. This electrochemical process entails administering an electrical current to destabilize and remove contaminants through coagulation and precipitation mechanisms. The efficiency and versatility of EC make it a viable solution for addressing challenges related to wastewater treatment, industrial effluent remediation, and potable water production. The utilization of wastewater as an alternative water source is gaining prominence due to the combined pressures of rapid population expansion, heightened freshwater demand, climate change, and freshwater resource degradation. Urbanization and industrialization triggered to a surge in wastewater production and diversification. Wastewaters contain an extensive range of organic and inorganic pollutants, necessitating a variety of wastewater treatment technologies for their effective removal. Electrocoagulation (EC) is a versatile, dependable, and affordable wastewater treatment technology with high efficiency in removing pollutants, as well as low sludge production compared to other methods. EC can effectively eliminate a vast range of pollutants from wastewater, containing suspended solids, dissolved solids, heavy metals, oil and grease, and organic matter which does not necessitate the use of harsh chemicals, which reduces the risk of environmental damage.

Keywords— Electrocoagulation, wastewater, Pollutants, Potable water

DESIGNING OF A VOICE – BASED PROGRAMMING IDE FOR SOURCE CODE GENERATION

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Abstract—Nowadays coding is not a complex thing to do, by the advancement in technologyand AI gives a crucial role in the easiness to the day-to-day life of human beings. Traditional type of coding is complex and not everyone is flexible with that, by using the voice coding wecan make coding easier. Here we are integrating the gpt model to find the required code they asked for, this is done with the help of Natural Language Processing and Speech Recognition. We are integrating python libraries with the open AI model gpt 3.5 to get the answers in response to the speech input that is given by the user. Python libraries are used for these functions: converting audio to text format and searching the text in the gpt model and responsethat is given by the model·

Keywords— deep learning, natural language processing, source code generation, voice to source code, voice-based ID

Crop Yield Prediction Using ML

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Abstract—India's agriculture sector is pivotal to the nation's economy and sustains livelihoods for millions. With diverse agro- climatic zones, India boasts a rich agricultural heritage encompassing crops like rice, wheat, sugarcane, and cotton. For farmers, decision-makers, and other stakeholders to allocate resources and ensure food security, accurate crop yield prediction is essential. This study looks into how machine learning algorithms might be used to increase the precision of crop yield forecasts in India. The study looks at how machine learning models can take into account a number of variables that impact crop yields, such as crop type, season, state, area, fertilizer, pesticide, and rainfall. The effectiveness of various algorithms, such as Linear Regression, Lasso, Ridge and DecisionTreeRegressor, is evaluated. Out of the three Machine Learning methods, the DecisionTreeRegressor algorithm demonstrated the best performance, as seen by its lowest MAE (mean absolute error) value and highest R^2 value. These findings imply that machine learning algorithms have the potential to greatly increase agricultural yield projections' accuracy in Morocco, which might enhance food security and maximize farmers' use of available resources.

Keywords— Linear Regression, Decision Tree Regression

Multiple Detection and Diagnosis of Skin Diseases using CNN

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Abstract—One of the most sophisticated deep learning techniques, convolutional neural networks (CNNs), has revolutionized the field of medical image analysis by enabling previouslyunheard-of levels of efficiency and accuracy in the identification of illnesses. Using a heterogeneous dataset containing images of common skin conditions, including acne, actinic keratosis, basal cell carcinoma, and melanoma, we examine how well different CNN models detect and distinguish between these conditions.

The study covers preprocessing techniques like data augmentation and normalization to increase the resilience of the models. Furthermore, we investigate the effects of various CNN architectures (e.g., VGG, ResNet, Dense Net) on classification performance considering computational efficiency and model complexity. Through extensive testing and evaluation, we quantify each model's classification accuracy, sensitivity, specificity, and computational overhead, providing insightful data on how well- suited it is for real-world clinical applications. We use CNN models to demonstrate the interpretability of the learned features, assisting dermatologists in understanding the discriminative pat- terns utilized in disease diagnosis. The proposed framework not only improves the accuracy and efficacy of diagnosis, but it also serves as a helpful educational tool that helps physicians better understand the wide range of skin conditions they treat. When combined, these results provide credence to the ongoing effortsto incorporate deep learning into automated health systems, which could lead to improved patient care and dermatological diagnostics. To tackle this, deep learning algorithms for accurate disease classification become crucial. Several machine learning algorithms were tested, and we found that the Deep CNN model with contrast stretching yields the best results. The dataset was divided into two categories: test and train image datasets forthe four diseases mentioned above, and a validation dataset. Subsequently, we trained our model on this data, yielding an accuracy of 92.7%.

Index Terms—Deep-CNN Model, HTML, JavaScript, CSS, Python

Fit Quest: Gamify Your Workout

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Abstract—With prolonged siWith prolonged sitting and de- creased physical ac- tivity levels among gamers, especially chil-dren and adolescents, there is a pressing need to address the negative health effects such as musculoskeletal issues. Our project tackles the sedentary behavior associated with traditional gaming by introducing exergaming, a web- based software enabling gameplay through body gestures and movements for character navigation. By harnessing camera vision technology, users can engage in physical activity while playing web-based games. Our implementation utilizes Python programming to seamlessly integrate this innovative system. The sedentary lifestyle preva- lent in gaming culture poses significant health risks, including musculoskeletal issues and decreased physical activity levels, particularly among children and adolescents. Exergaming pro- motes physical involvement and active gameplay, combating the negative effects of prolonged sitting and sedentary behavior. Through our project, we aim to revolutionize gaming into a medium that not only entertains but also encourages physical activity and well-being.

Index Terms—Active video games, exergame, Physical Activity, exercise, fitness

Deep Learning for Cyber Threat Detection

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Abstract—The study explores how deep learning, specifically convolutional neural networks (CNNs) and recurrent neural networks (RNNs), can be applied to improve cyber threat detection. Deep learning, a subset of machine learning with the remarkable ability to learn complex patterns from data, makes it a powerful tool for this critical task. By enabling the analysis of diverse data types, including images, network traffic logs, and system logs, deep learning architectures play a crucial role in cyber threat detection. Feature representation is a critical aspect of deep learning-based cybersecurity, involving methods for pre-processing data to extract meaningful features suitable for model input. For analyzing sequential data, such as network traffic patterns and system event logs, recurrent neural networks (RNNs) are a strong choice. Image-based threat analysis benefits significantly from convolutional neural networks (CNNs) due to their ability to process visual data effectively. The acquisition of high-quality training data is essential for training effective deep learning models. Researchers employ various strategies, including synthetic data generation, data augmentation, and collaboration with cybersecurity threat intelligence providers, to acquire diverse and representative datasets. The applicability of deep learning models for cyber threat detection is demonstrably effective across diverse scenarios and attack vectors. Real- world use cases in malware detection, intrusion detection, phishing detection, and behavioral analysis showcase their capabilities in various security domains. Performance evaluation using metrics like detection accuracy, false positive rates, detection speed, and scalability is essential for this assessment. Adversarial robustness is a critical consideration in deep learning-based cybersecurity, addressing the challenges posed by adversarial attacks aimed at evading or poisoning the models.

The research methodology involves a combination of literature review, experimentation, and empirical analysis. Researchers leverage publicly available datasets, simulation environments, and open-source deep learning frameworks to conduct experiments and validate proposed approaches. The potential contributions of this research include identifying

effective deep learning architectures and techniques for cyber threat detection, providing insights into practical considerations and limitations, and offering recommendations for deploying deep learning- based security solutions. In conclusion, deep learning holds immense promise for enhancing cyber threat detection capabilities, enabling automated, scalable, and adaptive security solutions. The ever-evolving threat landscape in cybersecurity constantly pushes researchers to advance the state- of-the-art in deep learning. Their goal is to develop more robust and proactive defense mechanisms to effectively counter these emerging threats

Keywords—Deep Learning, Convolutional Neural Networks, Recurrent Neural Networks, Threat Detection, Adversarial Robustness, Cybersecurity.

Smart Attend Insights

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***Abstract*—**Smart Attend Insights automates attendance track- ing with the use of deep learning algorithms and cutting-edge face detection technology. In addition to offering real-time information and warning students when attendance drops below 75%, it also promotes communication by texting parents and tutors about absence lists. In order to meet attendance goals, students can estimate the number of class days required, and reminders help to guarantee that institutional policies are followed. In order to create study groups that include a mix of students from different academic backgrounds, deep learning algorithms also evaluate academic performance. This promotes collaborative learning environments. This ground-breaking solution improves performance, accountability, and engagement for the benefit of parents, teachers, students, and institutions.

Index Terms—Facial recognition technology, attendance tracking, deep learning, Automated attendance tracking, Student engagement

AGRISEN
Precise irrigation System and Smart health monitoring system

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Abstract—The Smart Gardening System utilizing IoT is a transformative approach that integrates technology with gardening practices. By employing IoT sensors, real-time data is collected on crucial factors like soil moisture, temperature and humidity. This data is processed to offer actionable insights and personalized recommendations for optimal plant care. With automated irrigation control, water usage is optimized based on accurate soil moisture readings, promoting efficient resource management. The system empowers users to remotely monitor and manage theirgardens using smartphones or computers, simplifying gardening tasks and making them accessible to all. The system also integrates detection of plant diseases which empowers plant growth and health. The Smart Gardening System emphasizes a harmonious blend of modern technology and nature, catering to the needs of both seasoned gardeners and those new to the endeavour.

Keywords——Smart Irrigation, Water Level, Sensor, Type of plant, Plant disease detection

PARK-EZE
An IoT based Smart Parking System using DLSTM Prediction

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Abstract—In response to escalating urbanization and vehicular congestion, our project PARKEZE a Smart Parking System introduces an innovative solution integrating IoT and DLSTM (Deep Long Short Term Memory) technologies. By employing IoT sensors for realtime data collection and DLSTM for predictive analysis, the system PARK-EZE aims to revolutionize parking management. This exploration delves into PARK-EZE's design, implementation, and transformative potential, elucidating its role in creating smarter, more sustainable urban spaces. Through comprehensive data analytics, PARKEZE seeks to alleviate congestion and inefficient parking allocation, fostering efficient urban mobility patterns. PARK-EZE represents a paradigm shift towards efficiency, accessibility, and environmental stewardship in urban environments.

Keywords—PARK-EZE, Prediction, Real-time parking data

DeepScan
A Deep Fake Video Detection System

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Abstract—*Deepfake* is defined as a multimedia content synthetically modified or created through automatic (or barely controlled) machine learning models. The rise of deepfake technology points out the importance of accurate detection methods. In this article, we propose a deepfake detection system based on Long Short-Term Memory (LSTM) networks and the ResNext architecture. Users can upload videos for examination, which determines if they are legitimate or fake. LSTM evaluate face motions, gestures, and expressions, whereas ResNext identifies and extracts facial features and landmarks. Additionally, we provide users with an option to report suspected deepfake videos via email, facilitating community involvement in identifying fraudulent content. Moreover, our platform includes a directory of legal advocates, enabling users to seek legal support tailored to their location and needs. In conclusion, our deep learning-based deepfake video detection project represents a vital step in addressing the growing threat of digital manipulation.

Keywords—Deepfake, Artificial Intelligence (AT), Deep Learning, Video Analysis, Facial Recognition, Video Authentication, Detection.

Green Waste Utilization for Sustainable Energy Engineering Application: A Path towards Green Circular Economy

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Abstract—This project work emphasis on the utilization of green waste for various electrical engineering applications. The green waste is one of the major sources of waste in rural areas, where the agriculture is the livelihood of people. The conversion of green waste into activated carbon for the usage in batteries and super capacitors are gaining prominence and this project focuses on the hybrid combination of green waste sources for the generation of activated carbon. The utilization of green waste is vital since there are no chemical hazards in the materials and it serves as a waste disposal remedy also. This work focuses on the Kottayam district of Kerala state, where pineapple, coconut husk and banana peels are available in a surplus manner. The green waste is processed for each type separately, since the activation agent composition and pyrolysis temperature differs for each raw material. After the generation of activated carbon separately from each source of green waste, mixing is carried out in various proportions. The activated carbon generated is utilized in the fabrication of electrodes and supercapacitors.

Keywords— Agrowaste, Pollution, Waste Management, Energy Application

Real Time Scheduling And Navigation Portal

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Abstract—The Real-Time Location Sharing Project introduces a cutting-edge system designed to revolutionize communication safety and efficiency. Through seamless coordination and collaboration, users can instantly share their current location, enhancing both personal and professional contexts. With a strong emphasis on user authentication and privacy, this system ensures that sensitive data remains protected, offering a reliable solution for emergencies, events, and logistics management.

Keywords—Real-Time Location Sharing, user authentication, coordination, collaboration, communication safety, efficiency, privacy, robust mechanisms

Augmented Neat Algorithm For Enhanced Cognitive Interaction (NEAT-X)

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Abstract—Artificial neural networks (ANNs) are utilized in a variety of practical applications, from pattern recognition to controlling robots. Neuroevolution (NE), which involves the artificial evolution of neural networks through the use of genetic algorithms, has demonstrated significant potential in tackling complicated reinforcement learning tasks. This paper provides a comprehensive overview of the leading methods for evolving artificial neural networks (ANNs), called NeuroEvolution of Augmenting Topologies(NEAT). NEAT excels in evolving neural networks with diverse structures but faces scalability challenges, especially with extensive networks or high-dimensional input spaces. As the complexity of the problem increases, the search space expands exponentially, hindering NEAT's exploration effectiveness. After performing mutation, we identify the best mutations, and similar substructures are discovered and added to the mutation list. The improved version of NEAT algorithm requires less computational resources and will give optimized solution. After adding it to the mutation list with some minor modifications, it is demonstrated that the performance of NEAT can be improved.

Keywords—NeuroEvolution of Augmenting Topologies,NVIDIA Isaac Sim,Artificial neural networks,Neuroevolution

InsightAI
Bridging Natural Language and DataAnalytics

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Abstract—This project introduces an innovative application that leverages generative AI, specifically pre- trained large language models, for extracting and interpreting data from large databases, transforming it into comprehensible insights. The approach involves pretraining the model to establish a foundational understanding of language and context. Subsequently, the model is fine-tuned to specialize in database querying, learning to interpret natural language questions and translating them into precise database queries. The application further utilizes in-context learning, allowing the model to adapt and refine its understanding based on the specific context of database interactions. After retrieving the relevant data, the application employs generative AI algorithms to produce coherent, natural language answers. This process converts complex database information into easily understandable insights, bridging the gap between intricate data structures and user comprehension. To showcase this technology, the project applies these techniques to a large, synthetic dataset created using OpenAI API, simulating various customer surveys across different product segments and customer categories. For example, a user could query, "What do gold customers think about our premium broadband service?" The application would then generate and execute the appropriate database query, followed by presenting a summarized insight drawn from the data. This project not only simplifies interactions with large-scale data but also opens new avenues for advanced data analysis and informed decision making. The combination of pre-training, fine-tuning, and in-context learning harnesses the power of pre-trained language models, enabling the application to navigate and interpret complex databases with a high degree of accuracy and efficiency.

Keywords—Generative AI, Fine tuning, In-context learning, Natural language, OpenAI API, Pre- trainedmodels, Database querying

iAssist – An Intelligent Reading Assistant for Visually Impaired

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Abstract—Vision is a crucial human sense, and visually impaired persons encounter challenges in reading and comprehending text. While various devices and assistive technologies, including advanced mobile applications, have been developed to aid visually impaired individuals in reading, these solutions are often expensive and not universally accessible. Moreover, relying on mobile phones for text reading may pose discomfort, especially for elderly individuals with visual impairments. This proposed project aims to design a system that could assist the visually impaired individuals in reading the text using TTS (Text-toSpeech) and OCR (Optical Character Recognition) technologies. The integrated camera module captures the text, and image processing is carried out using OpenCV coded in python. OCR is employed to extract text from images, which is then articulated by the TTS conversion unit. Additionally, the system incorporates language translation functionality and aids users in identifying the objects in their immediate environment using Yolov9. The system comprises a camera, Raspberry Pi, power bank and earphones. This assistive device empowers blind and partially sighted individuals to gain autonomy in reading printed texts without relying on external assistance.

Keywords—TTS, OCR, Raspberry Pi, OpenCV, camera

PlateGuard: Ensuring Security with YOLOv5 ANPR Technology

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***Abstract*—**The Smart Gardening System utilizing IoT is a transformative approach that integrates technology with gardening practices. By employing IoT sensors, real-time data is collected on crucial factors like soil moisture, temperature and humidity. This data is processed to offer actionable insights and personalized recommendations for optimal plant care. With automated irrigation control, water usage is optimized based on accurate soil moisture readings, promoting efficient resource management. The system empowers users to remotely monitor and manage their gardens using smartphones or computers, simplifying gardening tasks and making them accessible to all. The system also integrates detection of plant diseases which empowers plant growth and health. The Smart Gardening System emphasizes a harmonious blend of modern technology and nature, catering to the needs of both seasoned gardeners and those new to the endeavour.The accomplishment of an Automatic Number Plate Recognition (ANPR) system stands as a pivotal solution in fortifying security measures for compounds necessitating stringent access control, such as educational institutions. In this pursuit, the focus lies on designing an efficacious ANPR system tailored to ensure only authorized vehicles gain entry into campus premises. Utilizing the advanced functionalities of the YOLOv5 (You Only Look Once) algorithm, celebrated for its instantaneous object detection abilities, the system excels in promptly recognizing vehicles as they approach the specified entry points. Upon detection, it promptly captures comprehensive vehicle images to initiate subsequent processing stages. Extracting the vehicle's number plate becomes paramount, followed by cross-referencing it against a meticulously curated registry of authorized faculty members' vehicles. Should a match occur, access is seamlessly granted; contrarily,unauthorized vehicles elicit a distinctive alert, signalling denial of entry. Implemented using Python, the system's performance undergoes rigorous evaluation using authentic real-world images sourced from campus gates.

Keywords—ANPR, YOLOv5, Python, campus gate

Virtual Air Canvas

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Abstract—This creative method of utilizing open-source frameworks to create gesture-controlled whiteboard devices is impressive. The device tracks and interprets finger movements collected by a camera to allow users to engage with a virtual whiteboard. The implementation includes effective data processing, hand landmark estimate, and real-time hand detection by utilizing computer vision algorithms. By providing a modern form of communication and going beyond regular typing and writing habits, the system seeks to expand beyond traditional writing methods and create new opportunities for connection. The system contributes to the changing field of human-computer interaction by offering an alternate mode of communication, which improves people's quality of life overall. It also demonstrates the versatility of gesture-controlled systems in terms of enhancing communication accessibility.

Keywords—Data Processing, Handmark Estimation, Computer Vision algorithms, MediaPipe, OpenCV.

Revolutionizing Football Management: A Data-Driven Approach with Random Forest Regressor

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Abstract—In the context of football management, depending solely on subjective evaluations and expert opinions can create significant challenges in player selection and strategic planning, potentially resulting in less-than-ideal outcomes. Relying solely on human judgment can result in errors and inefficiencies, limiting teams from reaching their full potential. Managers face challenges in making objective tactical decisions and assessing player suitability accurately. This highlights the necessity for a data driven paradigm shift in football management. Utilizing the Random Forest Regressor, an advanced analytical method offers a systematic and fact-based approach to decision-making. The data for this study was collected exclusively from SOFIFA.com, specifically focusing on Indian Super League (ISL) players. By leveraging this method and the comprehensive dataset from SOFIFA.com, teams can effectively analyze player attributes and performance data, aiding in the identification of transfer targets that align with both individual playing styles and team requirements. This approach not only enhances tactical decision making efficiency but also improves overall strategy formulation. Incorporating this cutting-edge algorithm empowers football managers to make better decisions, optimize squad composition, and ultimately elevate team performance on the field.

Keywords—player selection, strategic planning, Random Forest Regressor, transfer target, tactical decision-making, Indian Super League (ISL).

Utilizations of Autoclaved Aerated Concrete (AAC) Waste by Partial Replacement of Aggregates in Concrete

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Abstract—The construction industry in India is increasingly utilizing autoclaved aerated concrete (AAC) as a sustainable and ecofriendly building material due to urbanization. However, postdemolition AAC waste is often disposed of in landfills. This study explores using waste from AAC blocks to replace aggregate in concrete at different replacement levels. The results show that increasing AAC waste substitution leads to increased compressive and split tensile strengths, potentially strengthening and improving the material's sustainability. This could promote a circular economy in the construction industry.

Keywords—Autoclaved aerated concrete (AAC), Waste, Replacement, Mechanical properties.

HEALTH GUARD-A Multiple Disease Prediction Model Based on Machine learning

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***Abstract*—**The aim of the paper is to present a new approach to predicting multiple lifestyle diseases such as diabetes and heart disease using machine learning techniques. The proposed approach is based on ensemble learning, genetic algorithm based recursive feature elimination, and AdaBoost. The data is preprocessed using the Multiple Imputation by Chained Equations (MICE) technique to handle missing data. This technique is used to impute missing values in the dataset by creating multiple imputations and then combining them to create a final dataset. The proposed approach also uses genetic algorithm-based recursive feature elimination to determine the optimal feature subset. This technique uses a genetic algorithm to iteratively remove features from the dataset until the optimal subset is found. The AdaBoost classification model is trained alongside other predictive models for multi-disease prediction. AdaBoost is an ensemble learning technique that combines mul- tiple weak classifiers to create a strong classifier. An extensive comparative study has been conducted to evaluate the effectiveness of the proposed model. The results show that the proposed methodology outperforms existing works in terms of prediction accuracy, precision, and recall. Overall, this study demonstrates the effectiveness of ensemble learning and genetic algorithm-based feature selection in predicting multiple diseases. The proposed approach has the potential to improve disease prediction accuracy and help healthcare professionals make more informed decisions.

Keywords—AdaBoost, Machine learning

Childhood Epilepsy Syndrome Classification through a Deep Learning Network with Clinical History Integration

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***Abstract*—**In this conference paper, we present TSA3-D, a novel two-stream 3-D attention module-based deep network aimed at classifying childhood epilepsy syndromes using multichannel EEG data. Unlike existing research primarily focusing on seizure detection, we emphasize syndrome classification, integrating clinical history such as age of onset, family history, and treatment responses as predictive features to enhance precision. We optimize EEG features through multichannel montage transforms to minimize artifact interference. TSA3-D incorporates channel-wise and dual spatial attention modules to improve feature learning. With data from 115 subjects covering seven epilepsy syndromes and a control group, our results demonstrate an outstanding accuracy of 99.52, surpassing existing state-of-the-art methods. This amalgamation of advanced deep learning and clinical history offers a promising avenue for precise syndrome classification, thereby facilitating improved diagnosis and tailored treatment strategies. .

Keywords— Childhood epilepsy syndrome, multichannel EEG, 3-D attention module

Pest Prediction in Rice using IoT and Feed Forward Neural Network

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***Abstract*—**Rice is a cereal grain, and in its domesticated form is the staple food for over half of the world's human population. Rice is the seed of the grass species Oryza sativa (Asian rice) or, much less commonly, O. glaberrima (African rice). It is cooked by boiling, or it can be ground into flour. It is eaten alone and in a great variety of soups, side dishes, and main dishes in Asian, Middle Eastern, and many other cuisines. Other products in which rice is used are breakfast cereals, noodles, and such alcoholic beverages as Japanese sake. Rice has become common place in many cultures worldwide; in 2021, 787 million tons were produced, placing it fourth after sugarcane, maize, and wheat. Stem borers are moths that attack rice crops. They feed upon tillers and causes dead hearts or drying of the central tiller, during vegetative stage and causes whiteheads at reproductive stage. Environmental factors such as relative humidity, rainfall, and temperature can influence the growth of stem borers in rice fields. This study aims to identify specific changes in environmental conditions, such as temperature, humidity, and rainfall that may trigger outbreaks of stem borers. By pinpointing these factors, the study aids in identifying hotspots of insect pests in rice fields and provides insights for farmers. Our proposed system is a machine learning model which takes in data from temperature, humidity and rainfall sensors in fields and uses it to make predictions, whether pest attack will occur or not, so that necessary precautions can be taken.

Keywords—Deep learning, FNN, pest prediction, Field Plant

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Wild Watch Sentry

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***Abstract*—**The aim of every farmer is to yield potential crop production every year. So, it is the responsibility of the farmer to protect the crop fields from wild animals' attack. Most of the wild animals often come into contact with agricultural crops in search of food especially at night-time. Some of these animals attack those crops which results in an increase in human-wildlife conflicts. As a result, Wild Watch Sentry (WWS) represents a revolutionary leap in crop protection by employing state of the art technologies. Prioritizing non-harmful deterrents, WWS minimizes losses for farmers while promoting sustainable agricultural practices and reducing conflicts between humans and wildlife. Its real-time monitoring capabilities not only enhance farm security and efficiency but also contribute to maintaining biodiversity and ecosystem balance. This is achieved by the YOLOv8 detection system and the production of a repelling audio. When a wild animal is detected, it recognises the species of the same accurately, produces a repelling sound that makes it go away from the crop field and parallelly sends an email to the field owner as an alert message.

Keywords—Crop protection, Sustainable agriculture, YOLOv8,

Epidemo: A Machine Learning Regression-Based Model

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***Abstract*—**In recent years, the world has witnessed the devastating consequences of disease outbreaks, highlighting the urgent need for effective epidemic management. An epidemic signifies the rapid transmission of illness to a substantial portion of a population within a short timeframe. The proposed system offers a proactive approach to this challenge by leveraging advanced Machine Learning (ML) regression tools. By analyzing diverse data sources such as historical disease trends, environmental conditions, and human behaviors, the system predicts the onset and spread of diseases, providing crucial early warnings for public health authorities and communities. Through timely implementation of preventive measures informed by these forecasts, authorities can mitigate the impact of epidemics, safeguard public health, and alleviate strain on healthcare systems. This proactive strategy underscores the importance of early intervention and data-driven approaches in combating and controlling disease outbreaks.

Keywords— Epidemic management, Proactive strategy

Enhancing LSD Image Classification Techniques: A Literature Review on Classification Techniques

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***Abstract*—**With an emphasis on lumpy skin disease (LSD) in cattle and other skin conditions, this paper provides an extensive literature review on current developments in disease detection approaches for livestock. Through the use of ensemble models, hybrid systems, preprocessing approaches, feature extraction strategies, and Convolutional Neural Networks (CNNs), researchers have significantly increased the efficiency and accuracy of diagnostic procedures. The review summarizes the results of several studies, stressing the advantages and disadvantages of various strategies and offering information on how well they work in agricultural contexts. Integration of domain expertise with image analysis, employing ensemble models to improve robustness, and investigating pretreatment methods for data improvement are some of the important subjects covered. This research adds to the ongoing efforts to protect animal welfare and agricultural productivity while revolutionizing disease detection procedures by analyzing the most recent advancements in livestock health monitoring.

Keywords— lumpy skin disease (LSD), CNN, livestock health monitoring

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Empowering Laptop Selection with Natural Language Processing Chatbot and Data-Driven Filtering Assistance

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***Abstract*—**In an era of vast laptop choices and intricate technical specifications, selecting the optimal laptop that aligns with individual preferences and requirements can be a daunting task for consumers. To address this challenge, we introduce Spec-Master, an approach that leverages natural language processing (NLP) chatbot technology and data-driven filtering assistance to transform the process of laptop selection. SpecMaster offers users an intuitive and personalized experience by integrating a conversational chatbot interface powered by NLP algorithms. The chatbot engages users in interactive conversations to understand their unique preferences, usage scenarios, and budget constraints. By analyzing user input, the chatbot provides tailored recommendations for laptops that best match the user's needs. Additionally, SpecMaster incorporates a data-driven filtering mechanism that allows users to further refine their laptop choices based on specific criteria such as performance, price range, brand preferences, and usage scenarios. This feature enhances the decision-making process by providing users with a curated selection of laptops that meet their specific requirements. Our experimental results demonstrate the effectiveness of SpecMaster in facilitating informed decision-making and enhancing the overall user experience in laptop selection. Through its innovative combination of NLP-based chatbot technology and data-driven filtering assistance, SpecMaster empowers consumers to make confident and informed decisions when choosing their next laptop.

Keywords— NLP, Chatbot, data-driven filtering assistance

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Multilingual Hardcoded Subtitle Extractor

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***Abstract*—**The Multilingual Hardcoded Subtitle Extractor revolutionizes the way language barriers are overcome in digital content. Through the utilization of state-of-the-art Optical Character Recognition (OCR) technology, it meticulously extracts text from video frames that contain hardcoded subtitles. This enables a seamless translation experience into the user's preferred language. The entire process is streamlined, resulting in the creation of a SubRip (SRT) file that facilitates global content accessibility and localization efforts. Whether it is individual content creators looking to expand their audience or extensive production teams aiming for international distribution, this extractor offers a versatile toolset to cater to diverse needs and preferences. With its user-friendly interface and automation capabilities, the Multilingual Hardcoded Subtitle Extractor simplifies the complexities of creating multilingual content. It empowers users of all skill levels to effortlessly navigate the translation process, fostering a more inclusive digital environment that celebrates linguistic diversity. By making multilingual subtitles accessible to all, this extractor not only enhances global content accessibility but also promotes cultural exchange and understanding on a global scale. It paves the way for a future where language is no longer a barrier to universal enjoyment.

Keywords— OCR, EasyOCR

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Controlling a Mini Game using a Brain-Computer

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***Abstract*—**The progress in Brain-Machine Interface technology has paved the way for innovative applications in various fields, including gaming. This investigation explores the growth and implementation of a novel BCI system for controlling a mini- game, showcasing the potential of direct brain-to-machine interaction in the gaming domain. The proposed system employs non-invasive electroencephalography (EEG) sensors to capture brain signals associated with specific mental commands. These signals are then processed using advanced signal processing techniques to extract meaningful features. Machine learning algorithms, such as classification models, are trained on these features to recognize and interpret user intent in real-time. To demonstrate the practicality of the BCI-controlled mini- game, a custom designed gaming environment is introduced. Users navigate and interact within the game solely through their mental commands, eliminating the need for traditional input devices. The mini-game serves as a platform to assess the accuracy, responsiveness, and user experience of the BCI system in a dynamic and engaging context. The study evaluates the BCI system's performance through user trials, analyzing factors such as accuracy, speed, and user satisfaction. Additionally, potential challenges and limitations of the BCI-controlled mini-game are discussed, and avenues for future research and improvement are explored. This research contributes to the growing body of knowledge in BCI technology by showcasing its applicability in the gaming realm. The findings not only provide insights into the feasibility of using BCIs for interactive entertainment but also contribute to the ongoing efforts to enhance the accessibility and inclusivity of gaming experiences through innovative technological solutions.

Keywords— BCI; electroencephalography; mini-game; real-time; non-invasive;

A Critical Evaluation on Line of Sight Based Data Transmission: A Review

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***Abstract*—**The idea of Li-Fi (Visible Light Communication) as a safe way to transfer data between Android devices is examined in this review study. While previous research shows that Li-Fi can be used to transfer data utilizing smartphone components, the security implications of such a system are the main emphasis of this work. We examine the viability of an Android application that exchanges encrypted data via Li-Fi technology. To guarantee data confidentiality during Li-Fi transmission, encryption methods and other security precautions are addressed. The study evaluates and summarizes the Li-Fi and Android integration, emphasizing data rate constraints and the possible influence of ambient light on system performance. Finally we encapsulated different level of technologies that is been used to transmit the data based on line of sight communication.

Keywords— Li-Fi; Line of Sight Communication; VLC; Encryption; Android

A Blind-Friendly Navigation System Integrating RFID Technology for Enhanced Accessibility in Public Transportation

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***Abstract*—**This paper proposes a new system to improve accessibility and navigation for people who are blind at bus stops. The system uses RFID technology, which involves RFID readers, RFID tags on buses, bus stop modules, and camera-equipped blind sticks. When a visually impaired person arrives at a bus stop, they push the switch on their blind stick to activate the bus stop module. This triggers the system to capture information about the buses, using RFID technology. As buses with RFID tags pass near RFID readers, which are located 100 meters away from the bus stop, their information is transmitted to the bus stop module. This information, including bus numbers and routes, is then announced audibly to all passengers, making it easier for people who are blind to decide which bus to take. Once the blind person boards their desired bus, the system automatically turns off to save resources. This system provides a practical solution to help people who are blind navigate public transportation systems safely and independently.

Keywords— RFID technology; Visually impaired; Independent mobility; Sensor integration; Data capture and transmission

Driver Drowsiness Detection Using Python

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***Abstract*—**Drowsiness has emerged as a pervasive global concern, proving to be a major factor in catastrophic accidents that result in fatalities and severe injuries. The topic proposes novel experimental model designed to detect driver drowsiness, aiming to mitigate the occurrence of accidents and enhance overall transport safety. The approach integrates two distinct methods for effective drowsiness detection. Firstly, facial recognition techniques are employed to capture the driver's face and perform eye retina detection. Facial features are extracted, and blinking values are calculated. Threshold values for blinking are then established to gauge the driver's level of drowsiness. Secondly, an Arduino modules equipped with force sensors, is integrated into the system. The module continuously monitors the real-time pressure exerted by the driver's hands on the steering wheel. Threshold values for hand pressure are set to determine the driver's engagement level. The decision-making process involves synthesizing the results from both methods make a comprehensive assessment of the driver's alertness. If either the facial recognition system or the force sensors indicate drowsiness beyond the set thresholds, an alert is triggered. The implementation includes an alert system that provides visual, auditory, or haptic cues to prompt the driver to take corrective action upon detecting drowsiness. This dual-method approach aims to create a robust system for detecting and addressing driver fatigue, ultimately contributing to the reduction of accidents caused by drowsy driving and promoting overall road safety.

Keywords— Drowsiness detection, facial recognition, force sensors

TRIMBOT: AUTONOMOUS GRASS CUTTING ROBOT USING GPS NAVIGATION

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***Abstract*—**The integration of GPS technology into autonomous grass cutting bots represents a significant advancement in the realm of lawn maintenance. This paper explores the groundbreaking combination of GPS navigation and solar power in these bots, showcasing their potential to revolutionize traditional lawn care methods. By leveraging precise navigation technology, the bots effortlessly navigate through predetermined GPS coordinates, ensuring efficient grass cutting with unparalleled accuracy. Powered by solar energy, they not only demonstrate a commitment to eco-friendliness but also signal a shift towards widespread adoption of renewable energy in everyday applications. The paper discusses how the seamless integration of renewable energy sources with cutting-edge navigation systems transcends the limitations of conventional practices, leading to reduced carbon emissions and ecological footprint. Through case studies and technical insights, this paper sheds light on the innovative approach of autonomous grass cutting bots, offering a glimpse into a greener and more sustainable future for lawn maintenance practices

Keywords— Autonomous grass cutting robot, solar energy, GPS navigation, Sustainability, Lawn maintenance

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Lung Disease Detection from Chest X-ray Images Using Hybrid Machine Learning Model

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***Abstract*—** Lots of people die due to lung diseases in India alone. The human lungs is a complicated system where different diseases occur at different parts of this system. Some diseases, such as asthma, affect the airways of the lungs causing inflammation which results in shortness of breath. Diseases such as pneumonia, tuberculosis, and lung cancer affect the air sacs inside the lungs, which are called alveoli. The Covid-19 corona virus has significantly disrupted the global economy, culture, and health systems. Since the corona virus usually first causes symptoms in the lungs of patients, chest X-ray images can be useful in accurately diagnosing a patient. The rapid advancement in deep learning techniques has significantly impacted the field of medical imaging, particularly in diagnosing lung diseases. The proposed system aims to develop a hybrid machine learning model using InceptionV3 and DenseNet for the detection of lung diseases from chest X-ray images. Our work highlights the potential of machine learning models in automating the detection of lung diseases, providing insights into their comparative strengths and suggesting new pathways for future research.

***Keywords*— DenseNet, InceptionV3, Deep learning**

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Science for Humanity and Technology for Society

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- Centre for Water Resources Development and Management (CWRDM), Kozhikode
- Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI) Palode, Trivandrum
- Kerala Forest Research Institute (KFRI), Thrissur
- Kerala School of Mathematics (KSoM), Kozhikode
- National Transportation Planning and Research Centre (NATPAC), Thiruvananthapuram
- Srinivasa Ramanujan Institute for Basic Sciences (SRIBS), Kottayam
- Institute for Climate Change Studies (ICCS) Kottayam
- Malabar Botanical Garden and Institute for Plant Sciences (MBGIPS), Kozhikode

GRANT-IN-AID INSTITUTIONS OF KSCSTE

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