

# ICSIE 2025

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*Proceedings of*  
**15TH INTERNATIONAL CONFERENCE  
ON SCIENCE AND INNOVATIVE ENGINEERING  
15 ICSIE 2025**

**April 26th and 27th 2025**

**ISBN 978-81-983498-5-9**

*Organised by  
Prince Dr.K.Vasudevan college of  
Engineering and Technology, India.*

*In collaboration with  
Manipal University College, Malaysia.*



**15<sup>th</sup> INTERNATIONAL CONFERENCE ON  
“SCIENCE AND INNOVATIVE ENGINEERING – 2025”  
(ICSIE – 2025)**

April 26<sup>th</sup> – 27<sup>th</sup>, 2025

ORGANIZED BY

**ORGANIZATION OF SCIENCE AND INNOVATIVE  
ENGINEERING & TECHNOLOGY (OSIET)**

Chennai, India.

Website: [www.ijsiet.org](http://www.ijsiet.org)

In Association with

**PRINCE DR. K. VASUDEVAN COLLEGE OF ENGINEERING  
AND TECHNOLOGY**

Medavakkam - Mambakkam Road, Ponmar, Chennai – 600 127

Website: [www.psvpec.in](http://www.psvpec.in) | [www.princedrkrvasudevan.com](http://www.princedrkrvasudevan.com)

In Collaboration

**Manipal University College Malaysia (Melaka Campus)**

Melaka, Malaysia

<https://manipal.edu.my/>

## **ICSIE 2025**

Proceeding of 15th International Conference on Science and Innovative Engineering

**26<sup>th</sup> & 27<sup>th</sup> April, 2025**

### **Organized by:**

Organization of Science and Innovation Engineering & Technology

(OSIET), Chennai

### **Venue:**

Prince Dr. K. Vasudevan college of Engineering and  
Technology Medavakkam - Mambakkam Road, Ponmar,  
Chennai – 600 127

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## CHAIRMAN'S MESSAGE



I am delighted to welcome you all to the International Conference on Science and Innovative Engineering” (ICSIE 2025) which brings together experts and academics from around the world. The conference this year has brought together a tremendous and rich diversity of authors and speakers from universities, government and industry to share ideas and new perspectives on a wide range of Communications, Electronics, Networking, Computer Science, Mechanical and Electricals research and technologies. Addressing the new technical and business issues are essential to advance in today's engineering and technological environments. In order to provide an outstanding technical level for the presentations at the conference, we have invited more than 15 distinguished experts in the Engineering and Technology field to participate in the Advisory Committee. Academic excellence has always been the hall mark of our institute and we are committed to provide a comprehensive education which seeks to develop the students into academically proficient, morally upright and socially well integrated individuals. I would like to express my thanks to all authors for their outstanding contributions and in particular the members of the program board for their competent evaluation of the large number of submissions

We are very pleased with the quality, depth, and breadth of this year's technical program. I wish you a most enjoyable experience at the Conference.

Dr.K.Vasudevan

Chairman

Prince Group of Educational Institutions

## VICE CHAIRMAN'S MESSAGE



The words “Engineering” and “Technology” are not just words but are vital disciplines that guide the world by bringing huge changes to the current way of living. Modern Engineering and Technological innovations are making people think that nothing is impossible in this world. Everything can be achieved with an extremely powerful vision and a path to attain that vision. If a person is doing a marvel, keep in mind that you too can outshine them with perseverance. Dr. A. P. J Abdul Kalam said “Dream is not something that comes when you sleep, it is something that doesn’t let you sleep”, so, dream a lot about how to bring changes and try to make the changes come true. Remember earning money is not life; it is just a part of life which can be easily earned when you do it with dedication. Science and technology have become so closely intertwined, and I hope the conference will help you to reinforce each other.

We are very much elated in welcoming you all to our college for the 15<sup>th</sup> International Conference on Science and Innovative Engineering and I wish the students all the very best for their presentations.

Dr. V. Vishnu Karthick,

Vice Chairman,

Prince Shri Venkateshwara Padmavathy Engineering College.

## **ADMINISTRATIVE OFFICER'S MESSAGE**



The world is growing fast in fact it grows in such a way that a thing invented yesterday becomes obsolete today, which means there is a plethora of competition in each and every discipline of engineering and technology. This scenario goes well with a famous quote of a philosopher Heraclitus, who said, “Change is the only constant in this world.” Nowadays people need new inventions for their daily works so that they can do it with ease. People not only need to do their activities with ease but they also need it to be done within a period of time. As an engineer we need to solve problems that are left unsolved. As a way of showcasing the talents of young minds to find solutions we have organised this 15<sup>th</sup> International Conference on Science and Innovative Engineering.

I welcome you all to this event, my warm wishes to the students who are going to present their papers and also hearty thanks for the staff who have made this event a great success.

Er. K. Parthasarathy

Administrative Officer

Prince Group of Educational Institutions

## PRINCIPAL'S MESSAGE



I am indeed most delighted to chair this 15<sup>th</sup> International Conference on Science and Innovative Engineering (ICSIE 2025). The sharp, clear sighted vision and precise decision making powers of our management has benefited our college to stay competitive. The Pedagogy at the Institute is Modern where a variety of learning, behavioural tools are used in quality pursuance of knowledge, development of skills, attitudes, and values complemented by academia-industry interface imparting uniqueness to our programme. The Institute focuses on the holistic development of its students through variety of methodologies and extracurricular activities the whole year round. Today, we live in an era of incredibly rapid technological change. Technology has dominated our lives and we now have the ever evolving technology at our finger tips. Symposium, Seminars and International Conferences and Workshops are organized in the institute for their overall development. Teaching and Research are the two primary activities through which we fulfil our Mission and Objective. The Institute takes pride in welcoming the National and International participants for 15<sup>th</sup> International Conference.

With a firm foundation of the past and high hopes for a bright future, I wish everyone good luck and prosperity ahead. May we grow many technological wings!

Dr. T.Sunder Selwyn

Principal

Prince Dr. K. Vasudevan College of Engineering and Technology.





**MANIPAL**  
UNIVERSITY COLLEGE  
MALAYSIA



Greetings to all esteemed faculty, researchers, industry leaders, and students attending the 15th International Conference on Science and Innovative Engineering (ICSIE 2025) at Prince Dr. K. Vasudevan College of Engineering and Technology, Chennai, India. I am honored to be delivering the keynote address at this prestigious event on April 26th & 27th. This conference presents a remarkable platform to explore the latest advancements and trends shaping the landscape of engineering, technology, and management. This conference fosters a dynamic environment where all researchers can engage in thought-provoking discussions, share ground-breaking research findings, and forge meaningful collaborations. These interactions will undoubtedly spark innovation and propel us towards a future brimming with possibilities.

Whether the delegates are seasoned professional or a budding researcher, I believe that ICSIE 2025 will offer a unique opportunity to learn from each other, share everyone's perspectives, and build lasting connections. I am eager to connect with all of the delegates and witness the innovative ideas that emerge from this vibrant gathering. Together, let us push the boundaries of knowledge and create a future where engineering, technology, and management work in harmony for the betterment of our world.

I look forward to a stimulating and productive conference!!

**DR.REMYA VALLATHOL**  
**ASSOCIATE PROFESSOR, DEPARTMENT OF MICROBIOLOGY**  
**MANIPAL UNIVERSITY COLLEGE MALAYSIA**  
**MELAKA, MALAYSIA**





It's my immense pleasure and honor for participation and interaction into the 15th International Conference on Science and Innovative Engineering 2025 (ICSIE'25), organized by Prince Dr.K.Vasudevan college of Engineering and Technology Chennai, Tamil Nadu, India during April 26<sup>th</sup> & 27<sup>th</sup>, 2025. The importance of this conference must be emphasized, that will give a great platform for Students, Research scholars, academicians and industrialists to exchange their innovative and novel research experiences.

It's a great honor and privilege to be part of this conference and I would like to delight to welcome all the distinguished participating spokespersons. I must mention my deep sense of appreciation for the organizers and sponsors for coming up with such a noble thoughts.

**DR. S SHAMSHATH BEGUM**  
**ASSOCIATE PROFESSOR & HOD, DEPARTMENT OF POLYMER,**  
**B.S ABDUR RAHMAN CRESCENT INSTITUTE OF SCIENCE & TECHNOLOGY**  
**CHENNAI, INDIA**

## **ABOUT INSTITUTION**

Prince Educational Society was established in 1978 by our Founder - Chairman Dr. K. Vasudevan, M.A., B.Ed., Ph.D. Going down memory lane in the seventies, our Chairman had realized the need for an Institution which will serve as a role model and stand apart from other Educational Institutions.

## **VISION**

The main aim of Prince Dr. K. Vasudevan College of Engineering & Technology is to meet the challenges and demand of the highly advanced scientific and technological fields and to prepare to meet the man power needs of the world.

## **MISSION**

To provide goal-oriented, quality-based and value-added education through state-of-the-art technology on a par with international standards. To promote nation - building activities in science, technology, humanities and management through research. To create and sustain a community of learning that sticks on to social, ethical, ecological, cultural and economic.

## **About PDKVCET**

Prince Dr.K.Vasudevan College of Engineering and Technology has emerged as one of the fastest growing institutions of higher learning in India. We started out as a modest institute in 2009, to serve the needs of the local community. Today, as we enter the 14th year, as a flagship institute, we continue to be in service of country and society. Prince Dr.K.Vasudevan College of Engineering and Technology has a plethora of traditions that make the institute a unique and truly special place. Our institution that produces the next generation of leaders and advances tomorrow's thinking. Prince Educational Society was established in 1978 by our Founder - Chairman Dr. K. Vasudevan, M.A., B.Ed., Ph.D. Going down memory lane in the seventies, our Chairman had realized the need for an Institution which will serve as a role model and stand apart from other Educational Institutions. The setting up of Prince Matriculation Higher Secondary School, Nanganallur, Chennai, helped in the evolution of Prince Matriculation Higher Secondary School, Madipakkam, Chennai, which met this need. In order to serve the poor and the needy, he started a Tamil Medium School as well. Today this educationist, Industrialist and pioneer heads an Arts and Science College and an Engineering College in Chennai. These Institutions aim at imparting quality education in the fields of engineering, arts and science.

## **OUR GROUP OF INSTITUTIONS**

Prince Shri Venkateshwara Padmavathy Engineering College

Prince Dr. K. Vasudevan College of Engineering & Technology

Prince Shri Venkateshwara Arts and Science College

Prince Matriculation Higher Secondary School,7,Kannagi Street, Madipakkam to Puzhuthivakkam, Chennai 091

Prince Sri Vari Vidyalaya CBSE School,93 ,College Road , Nanganallur, Chennai 114.

Prince Sri Vari Vidyalaya CBSE School, 12,Kannagi Street, Madipakkam to Puzhuthivakkam, Chennai 91

Shri Venkateshwara Higher Secondary School, 9,Kannagi Street, Madipakkam to Puzhuthivakkam, Chennai 91

Prince Matriculation Higher Secondary School, 67&68, College Road, Nanganallur, Chennai 114.

# **ICSIE 2025**

## **PATRON-IN-CHIEF**

Thiru. Dr. K. Vasudevan, M.A., B.Ed., Ph.D,  
Chairman, Prince Group of Educational Institutions.

Thiru. Dr.V.VishnuKarthik, MD, Vice-Chairman, Prince  
Group of Educational Institutions.

## **SECRETARY**

Er.K.Parthasarathy, B.E,  
Administrative Officer, Prince Group of Educational Institutions.

## **CONFERENCE CHAIR**

Dr.Sunder Selwyn, Principal,  
Prince Dr.K.Vasudevan College of Engineering

## **CHIEF GUEST**

Dr. S Shamshath Begum, Associate Professor & HoD, Department of Polymer,  
B.S Abdur Rahman Crescent Institute of Science & Technology, Chennai  
, India

## **SPEAKERS**

Dr.Remya Vallathol, Associate Professor, Department of Microbiology,  
Manipal University College Malaysia, Melaka, Malaysia

Dr. N.Sasirekha, Associate Professor, Sona College Of Technology, Salem,  
India

## **CONFERENCE SESSION CHAIR**

Dr. Harshavardhan Awari, Senior Assistant Professor, VNRVJIET, Hyderabad, Telangana

Dr B Dhanalaxmi, Associate Professor & HoD, Geethanjali College of Engineering and Technology, Hyderabad, Telangana

Dr. D R Sasi Rekha, Assistant Professor, Dayananda Sagar College of Engineering, Bangalore, Karnataka

Dr. Vaithyasubramanian.S, Assistant Professor, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai, TN

Dr. N Prabakaran, Associate Professor, SCOPE, VIT, Vellore, TN

Dr. N Dhayalan, Associate Professor, Department of CSE, Sri Venkateswara College of Engineering & Technology, Chittoor, AP

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## **261.A SECURE AND TRANSPARENT E-VOTING SYSTEM POWERED BY BLOCKCHAIN**

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The present age demands essential electronic voting systems to ensure stable, secure, and transparent elections. Traditional electronic voting platforms face numerous challenges, such as vulnerability to hacking, manipulation, and a lack of transparency. These systems are often targeted by malicious actors, making them unreliable and eroding public trust.

This project proposes a new electronic voting system that leverages blockchain technology to overcome these limitations. Blockchain ensures data immutability, decentralization, and top-tier security, making it impossible to alter votes once recorded. The system uses advanced cryptographic techniques and provides a permanent audit trail by recording votes on multiple network ledgers.

Voters remain anonymous while being able to verify that their votes are counted correctly. Smart contracts allow instant vote counting, reducing human error and speeding up the process. Additionally, the system incorporates double-layered security using biometric authentication or multi-factor authentication, effectively preventing impersonation.

The core goal of this system is to boost voter confidence by offering full transparency and easy access to the voting process. Blockchain's unchangeable nature enhances public trust in democratic procedures, encouraging greater participation and improving the credibility of elections.

## **262. AUTOMATED PNEUMONIA DETECTION USING CONVOLUTIONAL NEURAL NETWORKS ON CHEST X-RAYS**

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Pneumonia is a main cause of mortality worldwide which requires accurate and timely diagnosis for effective treatment. Our paper presents a Convolutional Neural Network (CNN) based model for the automated detection of pneumonia from chest X-ray images. The proposed system processes medical imaging data to classify chest X-rays as positive or pneumonia affected using deep learning techniques. The model was trained and evaluated on a publicly available dataset which allows achieving high performance with respect to accuracy, precision, recall, and F1-score. The result shows the potential of CNNs as a reliable and powerful tool for assisting radiologists in the early diagnosis of pneumonia and ultimately improving patient treatment and improving diagnostic workloads.

## **263. ENHANCING FOOTBALL MATCH PREDICTION ACCURACY WITH RECURRENT NEURAL NETWORKS AND SEQUENTIAL PATTERN RECOGNITION**

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Football match outcomes are shaped by a variety of factors, making it quite difficult to predict the results with high accuracy. This project is dedicated to creating an advanced football prediction system that utilizes Recurrent Neural Networks (RNN) to analyze historical match data, player statistics, and team performance metrics to forecast match results. Our method includes gathering and processing a detailed dataset, applying feature engineering, and implementing an RNN architecture with Long Short-Term Memory (LSTM) networks. To make the system user-friendly, we will design an interface that allows users to enter different parameters and get real-time predictions. We will assess the model's performance through metrics like accuracy, precision, and recall, alongside using cross-validation methods to confirm its reliability and effectiveness. Ultimately, this project seeks to deliver a scalable, precise, and interpretable football prediction solution for analysts, bettors, and fans, fostering a deeper understanding of what influences match outcomes.

## **264. AUTOMATIC DRUG DISPENSER AND MONITORING SYSTEM USING IOT**

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Prescription medication prevents and treats disease, but sticking to a schedule can be difficult. Putting in place mechanisms to boost adherence for improved health outcomes is one suggested remedy. Maintaining general health and controlling chronic illnesses require consistent medication use. An Internet of Things (IoT) reminder system has been created using data analysis. Its objective is to help the patient who neglects to take their medication. An Android application and an IoT-enabled gadget make up the suggested system. It focuses primarily on dementia patients. But everyone gains from it nonetheless. Patients won't have to stress over remembering to take their prescription each day. As it moves forward, the design and deployment of an IoT drug monitor and reminder powered by ESP32. It is primarily aimed for Android users and also creates an NTP server app and Blynk notification system. The prototype has a buzzer, servo motor, Blynk, NTP, ESP32, and an infrared sensor. There are several methods for testing sensor sensitivity. The input for Blynk is infrared sensors. Within a specific time, Blynk can get data from the sensitive infrared sensor. A tablet count for a certain slot is recognized by an infrared sensor. To take the tablet, press the button and the servo motor will rotate the drug slot. Similar to Blynk's time-based alerts, a buzzer will sound upon coding. The test results show that the project is capable of performing its intended tasks and producing the required results.

## **265. GRAIN SPOILAGE DETECTION USING IOT AND ML**

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According to the Indian Grain Storage Management and Research Institute, post-harvest losses account for approximately 10% of total food grains due to inadequate storage practices, as well as the presence of insects, rodents, and microorganisms. Financially, this amounts to an estimated Rs 7,000 crore. Meanwhile, India has a score of 27.3 on the Global Hunger Index, which is classified as very serious. It is evident that grain spoilage poses a significant challenge within the agricultural industry.

This paper outlines a project that utilizes Internet of Things (IoT) and Machine Learning (ML) technologies to collect critical data - temperature, humidity, and alcohol content. By analyzing this data, the system predicts the number of days until spoilage and alerts users accordingly.

The project is equipped with sensors that collect and transmit data to a central server. This server, integrated with an ML model, can predict the "days until spoilage". The results are displayed on a dashboard, ensuring that users receive timely alerts.

## **266. VOICE OF HELP: AI-DRIVEN MENTAL HEALTH ASSESSMENT AND SUICIDE PREVENTION THROUGH TEXT AND SPEECH**

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Suicide exists as a major international health issue because it leads to the death of more than 800,000 individuals each year. Social media platforms enable people to show emotional distress in the modern digital period thus presenting an essential time for prevention and quick mental health services. Distinct social media posts along with patient questionnaire responses become the training base data for model development. A detection system integrates five classification algorithms which use Logistic Regression, Random Forest, Naive Bayes and Support Vector Machine (SVM) and Artificial Neural Networks (ANN) to optimize different detection tasks. The system displays high accuracy levels through performance assessments conducted with precision, recall, F1- score calculation and confusion matrix evaluation methods. A web application based on Flask provides secure implementation of the system to users in a user-friendly manner. Users can access the system through text and speech input along with quiz activities and a chatbot helps users receive assistance from the NLP system. The system offers practical solutions to users based on their mental health conditions by recommending mindfulness techniques and critical hotline services. Users gain better transparency and comprehension from the model through visual representation of accuracy graphs and word frequency data. The end-to-end solution was developed to support both mental wellness professionals and online services that help identify vulnerable individuals before they receive proper care for emotional well-being and suicide prevention.

## **267. VIRTUAL PERSONAL TUTOR USING PALIGEMMA VISION LANGUAGE MODEL**

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Advancements in artificial intelligence and multimodal learning have paved the way for intelligent tutoring systems that offer personalized, adaptive educational experiences. This paper presents a Virtual Personal Tutor built on a fine-tuned Paligemma vision-language model, integrated with Stable Diffusion 3.5-Medium for generating illustrative visual content. The system processes both textual and visual inputs to deliver context-aware explanations tailored to the NCERT Class 10 Science and Mathematics curricula. Experimental evaluations reveal that the tutor achieves an overall answer accuracy of 87%, with an average response time of approximately 40.5 seconds per query and a user satisfaction score of 4.3/5. Multimodal outputs—including detailed text explanations, AI-generated illustrative images, and dynamic video summaries—demonstrate the model’s capacity to enhance student comprehension and engagement. Future work will focus on reducing inference latency, improving context retention across sequential interactions, and expanding the system’s domain coverage through adaptive learning strategies. This research underscores the transformative potential of integrating vision-language models into educational platforms to deliver scalable and interactive personalized tutoring.

## **268. MACHINE LEARNING BASED EXPERT SYSTEM FOR BREAST CANCER PREDICTION**

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Breast cancer continues to be among the top causes of death in women globally. Detection at an early stage is fundamental in enhancing prognosis and survival rate. Conventional methods of detection, including biopsy and histopathological analysis, are invasive, time-consuming, and prone to human error. To overcome the above limitations, machine learning has proven to be a valuable application in medical imaging, improving efficiency and accuracy of breast cancer prediction. Machine Learning-Based Expert System for Breast Cancer Prediction, utilizes mammography for the detection of cancer at an early stage. Fuzzy C-means (FCM) clustering and Principal Component Analysis (PCA) are some advanced image processing techniques utilized for extracting meaningful texture features from the images of the breast. For the classification task, the K-Nearest Neighbours (KNN) algorithm is used with a staggering accuracy rate of 92%. The system not only categorizes tumour presence but also indicates tumor edges, enabling doctors to visualize the affected area clearly. The improvement in terms of accuracy and efficiency is considerably higher compared to existing work. Most existing research was based on simple statistical characteristics or single-level wavelet transform, which confined their capability in identifying complex textures of tumours. Additionally, classification methods such as Support Vector Machines and Artificial Neural Networks, though efficient, on occasion caused computational overhead. To address this, this system combines multi-level feature extraction algorithms with an optimized KNN classifier, resulting in higher accuracy and lower processing time. With its enhanced predictive value, this expert system assists radiologists in making quicker, more accurate diagnoses, thereby ensuring improved patient outcomes and increased survival rates. Future upgrades may include deep learning for even more precise diagnosis.

## **269. AI-POWERED TRAVEL RECOMMENDATION SYSTEM: A HYBRID APPROACH FOR PERSONALIZED TOURIST EXPERIENCES USING MACHINE LEARNING**

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The demand for tailored visitor data systems that can improve user experience and maximize economic potential is rising as a result of the tourism industry's explosive growth. Individual preferences are frequently ignored by traditional trip planning techniques which results in ineffective decision-making and less than ideal travel experiences. System also struggles to find appropriate lodging that suits their demands and budget as well as to find pertinent destinations and local activities. This paper suggests an AI-driven travel recommendations that uses web scraping, machine learning, and API connections to give passengers precise, tailored and data-driven suggestions in order to overcome these drawbacks. For destination recommendations based on user choices and travel time, the system uses a hybrid suggestion approach that combines collaborative filtering and content-based filtering. Cosine similarity and TF-IDF are used for item evaluation in order to further improve recommendations guaranteeing that they are quite pertinent. Web scraping and YouTube application integration are used to provide users with comprehensive information about specific locations including descriptions, photos and trip guide videos. By recommending nearby attractions, giving details about each destination including its separation from the chosen spot and relevant photos the system also improves exploration. Additionally, by classifying stays into accommodations, homes, residences, luxury camps and small hotels and filtering them according to price ranges the system helps tourists find the best options for lodging. For smooth interaction, a streamlit-based graphical interface is used to display the accommodation data, pertinent films, and booking navigation. An SQL database is used to effectively administer the entire system storing recommendation data, travel history and user preferences. The suggested approach greatly increases the effectiveness, significance and availability of travel planning by fusing these cutting-edge AI-powered strategies with an easy-to-use interface which eventually helps both tourists and the travel sector.

## **270. CRIME RATE PREDICTION**

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Crime is one of the biggest and dominating problems in our society. Daily there are huge number of crimes committed frequently. Here crime rate prediction is an essential tool for law enforcement agencies, urban planners, and policymakers to identify and address potential crime hotspots. This project aims to build a predictive model that can forecast crime rates based on historical crime data,

demographic information, and other relevant socio-economic factors. By utilizing machine learning techniques, we analyze crime trends over time and identify patterns that can help predict future occurrences. The project employs a multi-step approach, starting with data collection from various sources such as government crime reports, weather data, and economic indicators. The data is then pre-processed to remove inconsistencies, handle missing values, and normalize features for effective model training. Several machine learning algorithms, including regression models and time series forecasting, are employed to predict crime rates. The findings from this project can assist law enforcement agencies in resource allocation, proactive policing, and crime prevention strategies, ultimately contributing to safer communities

## **271. AN IOT-ENABLED REAL-TIME HEALTH TRACKING SYSTEM USING NODEMCU AND WEARABLE SENSORS**

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In today's world, taking care of loved ones has become a challenging task. Monitoring a patient's health at home is a difficult task. Especially elderly patients need constant care and their loved ones need to take care of their health while working. Therefore, we want an innovation that can fulfill this task easily and successfully. Our system introduces a smart patient health monitoring system that uses sensors to measure patients' health conditions and uses the Internet to alert loved ones in case of any problems. Our system uses body temperature and heart rate to monitor the patient's health status. The sensors are connected to a microcontroller to monitor events, and to an LCD display and Wi-Fi connection to transmit medical data. If the system detects a sudden change in the patient's heart rate or body temperature, it will automatically send information about the patient's condition to the user via the Internet. Humidity on Yam and displays detailed information about the patient's heart rate and body temperature in real time. Time spent on the Internet. . In this project, heart rate and oxygen levels were monitored using the MAX30100 pulse oximeter and the MAX30100 pulse oximeter heart rate sensor module. DHT11 is a temperature sensor that uses solid-state devices to measure body temperature. A touch sensor is a device that detects and records physical touch or contact with a device and/or object. It allows a device or device to measure touch or proximity, usually from a human user or users. The health information of our authorized employees will currently be continuously updated via the Blynk cloud application. Therefore, IoT-based patient health monitoring systems can effectively use the Internet to monitor patient health and save lives in real time. The proposed IoT-based approach uses the NodeMCU ESP8266 system and is tested and validated on human devices. The results obtained from the system were promising: The data obtained from the system was stored very quickly. The results obtained from this system are realistic when compared to other products on the market. IoT devices can be useful in saving lives during the COVID-19 pandemic.

## **272. LANGVENTURE: A COMPREHENSIVE MULTILINGUAL LEARNING PLATFORM USING NLP**

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This project introduces an innovative multi-language learning website powered by advanced Natural Language Processing (NLP) technology. It aims to revolutionize language education by creating an interactive, adaptive platform tailored to diverse learner needs. The website leverages NLP tools like machine translation, named entity recognition, part-of-speech tagging, sentiment analysis, and speech recognition to enhance understanding of grammar, vocabulary, sentence structure, and pronunciation. Personalized learning paths adapt to users' proficiency levels and learning styles, ensuring focused improvement for beginners and advanced learners alike. Supporting various formats, including audio, video, text, and interactive exercises, the platform caters to auditory, visual, and kinesthetics learners. Notable features include simultaneous multi-language learning with context-based translations that facilitates real-time conversation practice. By combining cutting-edge technology with engaging, personalized experiences, this website promotes global communication and cultural understanding, making language learning more accessible, efficient, and effective for users worldwide.

### **273. COMPARATIVE ANALYSIS OF PROXIMAL POLICY OPTIMIZATION AND SOFT ACTOR-CRITIC IN DYNAMIC GAME ENVIRONMENTS**

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This paper presents a comparative analysis of two deep reinforcement learning (DRL) algorithms—Proximal Policy Optimization (PPO) and Soft Actor-Critic (SAC)—in dynamic environments. We evaluate their performance across metrics such as sample efficiency, exploration-exploitation balance, adaptability to moving targets, and training stability. Using Unity ML-Agents, we test both algorithms in three environments: a standard environment, a scaled-up environment, and a dynamic environment with moving targets. Our results demonstrate SAC's superior exploration capabilities and adaptability in complex environments, while PPO exhibits greater training stability in simpler setups. The study highlights trade-offs between on-policy and off-policy methods for real-world navigation tasks and provides actionable insights for algorithm selection in robotics, gaming, and autonomous systems.

### **274. ONLINE VOTING SYSTEM**

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The old voting methods can change to advanced voting methods. Online voting software is a modern solution that can efficiently and securely facilitate the voting process for various groups and organizations. The use of such software eliminates the need for physical polling stations, as voters can cast their ballots from anywhere with an internet connection. The benefits of using online voting software are many; it increases accessibility, saves time and resources, ensures accuracy and transparency, and supports a more democratic decision-making process. Eligibility verification and accurate voter information are essential components of a successful online voting platform. While several countries have already implemented online voting software, this approach still faces challenges and limitations that must be addressed before universal adoption. In the following sections, we will delve further into the various types of electronic voting methods and examine successful global examples of online voting. We will also discuss current trends and future developments in online voting software provide a comparison between online and traditional voting methods.

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## **275. DETECTION OF LEAF DISEASE USING ML TECHNIQUES**

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Agriculture is a vital pillar of the Indian economy and identification of plant diseases is necessary to controlling crop loss and preventing the widespread effect of infections many plants such as tomatoes apples cherries and grapes exhibit visible disease symptoms on their leaves offering an opportunity for timely diagnosis via visual patterns however manual examine is often inefficient and prone to errors creating a need for automated intelligent solutions.

## **276. EMOTION-BASED EMAIL NOTIFICATION SYSTEM USING AI AND GOOGLE OAUTH2**

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By analysing students' emotions during virtual classrooms, real-time emotion detection systems significantly increase the efficacy of online learning. Using AI-driven facial recognition techniques powered by Tensor Flow and Keera's, these systems detect emotions such as happiness, sadness, and confusion through live webcam input. The real-time feedback provided to educators allows them to modify their teaching approaches dynamically, ensuring better student engagement, motivation, and participation. The system is implemented using Python- based tools, pre-trained deep learning models, and GPU acceleration, ensuring efficient processing and accuracy. By bridging the gap between educators and students in virtual learning environments, this technology helps maintain an interactive and adaptive learning experience. Future enhancements may include multimodal emotion analysis by integrating voice and text recognition, providing deeper insights into student behaviour, comprehension, and engagement levels. Such advancements can contribute to more personalized and responsive online learning, making virtual education more effective and student-centric.

## **277. EMPOWERING VOICES: ENHANCING WOMEN'S REDRESSAL SYSTEMS USING NATURAL LANGUAGE PROCESSING**

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Women across the globe, particularly in regions with socio-cultural and economic barriers, face significant challenges in accessing legal resources and justice mechanisms. Issues such as domestic violence, workplace harassment, and property rights violations persist, despite the existence of legal frameworks meant to protect women's rights. A critical gap in legal accessibility arises from a lack of awareness, financial constraints, and fear of societal stigma, preventing women from seeking justice. This research proposes the development of a Women's Legal Assistance Chatbot, leveraging Large Language Models (LLMs) and Knowledge Graphs (KGs) to provide real-time, accessible, and confidential legal assistance. Unlike traditional redressal mechanisms, our system ensures context-aware, personalized, and empathetic responses, bridging the gap between legal provisions and practical accessibility. The chatbot integrates natural language processing (NLP), legal document generation, emergency support, and an intuitive interface to empower women with the knowledge and resources they need. By offering multilingual support, real-time guidance, and privacy-focused interactions, this research aims to revolutionize the way women interact with legal frameworks, ensuring equitable access to justice and protection of rights.

## **278. PRICE NEGOTIATING CHATBOT WITH TEXT & VOICE ON E-COMMERCE WEBSITE**

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Among the primary sources, this seems like a novel idea! Combining the benefits of both digital convenience and the interactive elements of conventional buying, using a chatbot for price negotiation gives e-commerce platforms a customized, dynamic touch. You may boost consumer engagement and trust by using machine learning (ML) to anticipate prices and implement a system that modifies offers according to client satisfaction. A clever strategy to provide flexibility while preserving sellers' profitability is the "first price" and "final price" structure. Making sure the chatbot can manage the subtleties of negotiations that may vary depending on user behavior, past purchases, or item demand is one difficulty you would want to think about. In order to preserve fairness, you might also look into how to handle possible abuse of this system (such as clients persistently vying for the best deal).

## **279. NEXUS VOTING SYSTEM**

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In this paper, the study examines the implementation of the Nexus voting system in order to build an Android application ideally designed for securely handling votes and elections with complete privacy on a digital platform, eliminating the need for paper ballots or in-person gatherings. The distinctive digital platform has protected all biometric data, guaranteeing that no voter casts multiple votes. This voting method works really well for remote elections. Our system utilized Firebase as a backend for registration, login, and record storage, similar to an immune system. All these factors contribute to making our app more secure and dependable. Additional aspects of the app encompass the implementation of Firebase ML Kit for face recognition, enabling voting one individual at a time,

meaning that only one distinct person may cast a vote at any given moment. Furthermore, the application verifies fingerprints using biometric information.

## **280. OBJECT DETECTION AND CLASSIFICATION USING GNN & YOLOV8 FOR VISUALLY IMPAIRED**

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This study presents an integrated approach to object detection and classification for visually impaired individuals using Graph Neural Networks (GNN) and YOLOv8. YOLOv8 ensures real-time, high-precision object detection, while GNN enhances contextual understanding by modeling relationships between detected objects. This synergy improves scene comprehension, enabling more accurate and meaningful environmental interpretations. The system offers audio feedback, guiding users safely and efficiently through complex environments. Experimental results demonstrate significant improvements in detection accuracy and contextual awareness, highlighting the potential of combining GNN and YOLOv8 for assistive technologies tailored to the visually impaired.

## **281. PRINTCONNECT: A DIGITAL BRIDGE BETWEEN STUDENTS AND PRINT SHOPS**

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This research paper proposes an intelligent, This print management system to enhance efficiency among university students and print shop owners by utilizing machine learning, edge computing, and real-time analytics. Traditional print services are constrained in fixed costs, no customizations, and delays in order processing. For these challenges to be solved, our system incorporates elements such as AI-powered dynamic pricing, predictive demand forecasting, intelligent print recommendations, and real-time order tracking. Machine learning processes historical data to optimize pricing and suggest the most cost-effective print settings, and edge computing allows for low-latency processing to make real-time decisions. The platform allows students to upload documents, customize print settings, and securely pay via an integrated Stripe gateway. A unique order ID and real-time tracking mechanism provide greater transparency to users. In addition, smart automated quality control, AI-powered personalization, and IoT-enabled print shop management enhance operational efficiency. Print shop owners are provided with real-time analytics and predictive insights to optimize resource allocation and workflow. This intelligent, adaptive platform revolutionizes traditional print services to make them scalable, cost-effective, and responsive to dynamic academic environments.

## **282. CONTROLLING PPT USING HAND GESTURES**

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The integration of gesture recognition technology into presentation software represents a significant advancement in the field of human computer interaction. This paper introduces a novel system for controlling PowerPoint presentations through hand gestures, aiming to provide a more intuitive and seamless user experience during public speaking or academic presentations. Utilizing a combination of computer vision algorithms and machine learning models, our system accurately interprets specific hand movements as commands to navigate between slides, activate embedded multimedia, and manage the presentation flow without physical contact. The core of our system employs a real time gesture recognition framework that leverages a camera to continuously monitor and analyze the presenter's hand movements. By implementing advanced image processing techniques and deep learning models, it distinguishes between predefined gestures such as swiping, pointing, or tapping in midair. These gestures are then mapped to corresponding control commands within the PowerPoint application, enabling users to effortlessly manage their presentation. To evaluate the effectiveness and user satisfaction of our gesture-controlled presentation system, we conducted a series of user studies involving participants from diverse backgrounds. The results indicate a high level of accuracy in gesture recognition, with participants reporting a significant improvement in the ease of use and engagement compared to traditional control methods. Furthermore, this system has been designed to be easily adaptable to various presentation environments and hardware configurations, making it a versatile tool for educational and professional settings. In conclusion, our gesture-controlled PowerPoint presentation system offers a promising solution to enhance the interactivity and accessibility of presentations. By harnessing the potential of gesture recognition technology, it opens up new possibilities for engaging and dynamic communication in both educational and professional contexts.

### **283. BLOODBIDGE – UNIFIED BLOOD DONATION SYSTEM**

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The Unified Blood Donation System is a web-based platform designed to simplify and automate the entire process of managing a blood bank. It aims to improve the overall efficiency and effectiveness of key activities such as blood collection, storage, and distribution. It allows for easy registration and management of donor information, blood collection, testing, and storage. The system facilitates online requests for blood and automates the matching of donor and recipient blood types. Key features include donor availability tracking, allowing donors to update their status to "available," "unavailable," or "on vacation." The system collaborates with healthcare providers to streamline communication and includes an appointment booking feature for donors to schedule donations on specific dates. Blood requests are sent to the nearest available donors and blood banks, with an urgency level indicator to highlight "critical" or "emergency" situations. This project aims to develop a user-friendly and scalable system that can be adopted by blood banks of various sizes, ultimately contributing to a more efficient and reliable blood supply chain.

### **284. IDENTIFICATION OF ANIMAL GENETIC VARIATIONS THROUGH DNA SEQUENCING USING MACHINE LEARNING**

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Eurasian J Med 2022; 54(Suppl. 1): —The Historical advances in DNA sequencing technology have highlighted the transition from previously launched methods to next-generation sequencing (NGS) platforms. Third-generation sequencing (GS) technologies in particular have attracted attention due to their ability to provide improved sensitivity in variant detection, especially when combined with long-read sequencing and other methods such as RNA sequencing and metabolomics. Despite the promise of GS, its full potential as a molecular diagnostic test has not yet been explored. The utility of genetic engineering (GS) depends on unraveling the complexities of genetic and allelic heterogeneity, multilocus rare mutations, and interactions between rare and common mutations from the specific. Furthermore, advancing differential diagnostic studies is essential to uncovering the medical applications of GS [1] . Advancements in DNA Sequencing Technologies and Their Clinical Implications

## **285. UAV AND IOT BASED PLANT DISEASE IDENTIFICATION AND PESTICIDES RECOMMENDATION**

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This system revolutionizes farm management by integrating AI-driven disease detection with targeted irrigation, optimizing resource use and enhancing crop health. A quadcopter drone equipped with a high-resolution camera and GPS conducts aerial surveys, capturing georeferenced images for real-time processing via an onboard edge intelligence unit. Advanced AI algorithms detect and map diseased areas, instantly linking infections to precise locations. This data is wirelessly transmitted to intelligent irrigation units, enabling precise water and nutrient delivery only to affected regions. By minimizing water waste and reducing unnecessary fertilizer and pesticide application, the system promotes sustainability while improving yields. Early disease detection further aids in proactive management, preventing widespread outbreaks. By combining drone-based remote sensing, AI-powered analysis, and precision irrigation, this solution enhances agricultural productivity, conserves resources, and supports sustainable farming practices

## **286. IMAGE ENHANCEMENT USING DEEP IMAGE PRIOR**

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Our work uses Deep Image Prior (DIP), an innovative strategy that differs from conventional deep learning techniques, to bring image restoration to life. DIP uses the inherent structure of convolutional neural networks (CNNs) to recover images straight from the distorted input, in contrast to models that rely on large datasets or pre-trained algorithms. The fundamental patterns of an image are captured by this self-supervised method, which makes it very efficient for tasks like Denoising (removing noise) and Inpainting (filling in damaged or missing areas) without overfitting to noise or artifacts. The beauty of DIP is that it improves photos by recognizing their natural structure without the requirement for external training data. A Python-based command-line backend and a Streamlit-based frontend are used by the platform to make this potent engine accessible. Uploading photos, selecting between Inpainting and Denoising, and even batch processing many images at once are all options available to users. By combining cutting-edge DIP technology with a lightweight, efficient interface, the platform enables photographers, researchers, and anybody wishing to improve image quality to execute complex restoration effortlessly and intuitively.

## **287. SMART NAVIGATION ROBOT USING ARDUINO**

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The Smart Navigation Report is an autonomous system that can be used for navigation by avoiding obstacles, which can be useful for automation and exploration as well as educational purposes. It makes use of an Arduino Uno as the central controller to process data from an ultrasonic sensor, which relies on distance measurement to identify obstacles. The robot's movement depends on DC motors with wheels, which is controlled by an L298N motor driver. A servo motor, on the other hand, rotates the ultrasonic sensor for a wider scope of obstacle detection. All these are mounted on a strong chassis. Such a robot can be applied in home automation, especially cleaning and navigation, surveillance in hazardous environments, educational projects that may use to demonstrate robotics concepts, and warehouse automation of transporting goods as obstacles avoiders. This robot has many real-life uses. Some of these applications include home automation: the robot can be applied in removing dust using automated cleaning, moving around furniture and other objects. In industry, it can be used in the automation of warehouses where goods are being moved without collisions. It is also very useful in surveillance, especially in hazardous environments that expose humans to dangers, such as mines or disaster areas. The Obstacle Avoider Robot is a versatile and practical hardware and software system that effectively performs navigation.

## **288. DEEP LEARNING – DRIVEN LUNG CANCER DETECTION AND DIAGNOSIS USING ENHANCED CT IMAGING ANALYSIS**

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Lung cancer is one of the deadliest diseases in developed countries, with early diagnosis posing a significant challenge. Timely detection is crucial, as it can greatly improve patient survival rates. Traditional diagnostic methods often lack efficiency and accuracy, necessitating advanced techniques for better classification. This paper presents a deep learning-based approach for lung cancer detection and classification using the AlexNet Convolutional Neural Network (CNN) model. AlexNet, a widely used transfer learning model, is employed to differentiate between malignant and benign lung tumors. The model is trained on lung cancer imaging datasets to extract relevant features and make precise classifications. Compared to conventional neural networks and traditional machine learning techniques, the proposed approach demonstrates superior performance in terms of accuracy, robustness, and efficiency. By leveraging the power of deep learning, the system significantly enhances early lung cancer detection, aiding in timely diagnosis and treatment. The experimental results validate the effectiveness of the proposed CNN-based approach, offering a reliable solution for improving lung cancer diagnosis and ultimately saving lives worldwide.

## **289. A CLEVER SOLUTION FOR MANAGING CAREER DEVELOPMENT AND LEARNING**

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The job Assistant Website is a user-friendly, interactive tool that assists people in evaluating and improving their job possibilities. The website has a number of features, such as an intelligent resume evaluation system, personalized course recommendations based on career aspirations, and an aptitude test to assess users' verbal, numeric, and logical skills. The website provides a smooth, responsive experience on all devices thanks to its React and JavaScript architecture. While the course suggestion system offers customized learning routes to assist users in acquiring the skills necessary for particular industries and firms, the aptitude test gives users immediate feedback on their areas of strength and progress. The resume upload feature also evaluates users' resumes, giving them a score and useful advice to help them increase their chances of finding employment. The website hopes that these tools will help users make better career decisions, develop their skills, and apply for jobs more effectively. The modular architecture of the system guarantees adaptability and scalability for upcoming additions, like career path counseling and AI-powered CV review. In a job market that is changing quickly, the Career Assistant Website provides a complete resource for anyone trying to advance their career.

## **290. ENHANCED TUBERCULOSIS PREDICTION USING MACHINE LEARNING MODEL BASED ON HYBRID FEATURE SELECTION TECHNIQUE**

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Tuberculosis (TB) remains a major global public health concern, characterized by high mortality rates and diagnostic challenges, particularly in resource-limited settings. Traditional diagnostic techniques often suffer from low sensitivity and delayed results, necessitating improved predictive models for early

detection. This study proposes a novel ML framework that combines multiple feature selection techniques to enhance TB diagnosis. The dataset, sourced from National Center for Biotechnology Information (NCBI), underwent data preprocessing using StandardScaler to ensure uniform feature scaling. Feature selection methods, including Mutual Information (MI), Analysis of Variance (ANOVA), and Recursive Feature Elimination (RFE), were utilized to extract the most relevant features.

To further improve model performance, a hybrid approach combining Genetic Algorithm (GA) with RFE was introduced to refine the feature selection process and identify optimal feature subsets. For classification, three ML models Logistic Regression (LR), RandomForestClassifier, and Support Vector Classifier (SVC) — were applied to predict TB diagnosis outcomes. The hybrid GA-RFE approach enhanced model performance by effectively identifying optimal feature combinations, leading to improved accuracy, precision, recall, and F1-score compared to standalone feature selection techniques. Among the classifiers, RFC demonstrated the highest predictive accuracy when paired with the hybrid GA-RFE technique. The proposed methodology demonstrates the potential of combining evolutionary algorithms with established feature selection methods to improve TB diagnostic accuracy.

## **291. WOMAN SAFETY NIGHT PATROLLING ROBOT USING SHAKE2SAFETY APP**

The safety of women, particularly during nighttime, remains a critical concern in many areas. This paper presents a conceptual design for a Women Safety Night Patrolling Robot integrated with the Shake2Safety app, a mobile application that allows users to send emergency alerts through a simple phone shake. The proposed system aims to enhance the security of women by combining mobile technology with autonomous robotics. When a woman activates the Shake2Safety app during a distress situation, it sends an immediate alert to a network of responders and simultaneously directs a robot patrolling nearby to the user's location. The robot, equipped with cameras, sensors, and GPS, autonomously navigates to the incident area, providing realtime surveillance, monitoring, and communication between the user and authorities. This innovative integration ensures quick response times, real-time video streaming, and a visible deterrent to potential threats. Furthermore, the robot's patrol routes can be optimized for high-risk zones, ensuring consistent coverage during nighttime hours. By offering 24/7 surveillance and instant intervention capabilities, the Women Safety Night Patrolling Robot, supported by the Shake2Safety app, can significantly contribute to improving women's safety in urban environments. The system addresses key issues such as rapid response, privacy, and the need for continuous monitoring while offering a scalable solution for smart cities.

## **292. MULTI-CLASS LUNG NODULE CLASSIFICATION AND LOCALIZATION FOR CANCER DETECTION**

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As one of the top causes of cancer-related death globally, lung cancer underscores the importance of early and precise detection techniques. The method used in this study to identify and categorize lung cancer from CT scan images is sophisticated and combines YOLOv8 with deep learning architectures, such as CNN and ResNet50 models. Four groups are identified by the. High accuracy is demonstrated by the experimental results, which surpass conventional techniques with 98.39% accuracy with the CNN model and 99.19% accuracy with the ResNet50 model. YOLOv8 is used to improve nodule detection, and CNN and ResNet50 are integrated to guarantee strong classification performance. With

the potential to support early intervention and increase patient survival rates, this work represents a major advancement toward accurate, automated lung cancer diagnosis.

### **293. KNOWLEDGE GRAPH-DRIVEN SYSTEM FOR AUTHOR COLLABORATION AND ARTICLE RECOMMENDATIONS**

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In a university setting, where collaborative research contributes to institutional rankings, this proposed work tries to encourage targeted, impactful partnerships across disciplines. Through intelligent querying of the knowledge graph, this system can support institutions or any author in advancing towards high-impact research networks and promoting academic visibility. The authors present an Author Collaboration Recommendation System targeted at accelerating interdisciplinary collaboration by allowing users to discover researchers with specific expertise across departments and domains. The system utilizes knowledge graphs to build a robust and dynamic database, consisting of author nodes with details as paper titles, and domain expertise, interconnected by various relationships. The collaboration-seeking author can obtain personalized author recommendations by choosing research domains or entering keywords, with results displayed. The proposed system captures both direct mapping and indirect mapping of collaborators and provides an overall coverage.

### **294. EARLY DETECTION OF SCALP PSORIASIS USING DEEP LEARNING**

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Psoriasis, particularly when effecting the scalp, poses significant health concerns due to its chronic nature and potential for psychological impact. Early and accurate detection is important for effective management and treatment. This study provides a convolutional neural network (CNN) based classifier for the early detection of scalp psoriasis using image dataset. The model is designed to classify scalp images into two categories: healthy and unhealthy. Extensive training and validation of the model have resulted in a validation accuracy 93.97% and the necessary test accuracy of 99.79%. These outcomes underscore the potential of deep learning approaches in enhancing diagnostic accuracy and providing reliable, non-invasive diagnostic tools for dermatological conditions such as scalp psoriasis.

### **295. EXPLORING SENTIMENTS AND EMOTIONS IN ENVIRONMENTAL DISCUSSION ON SOCIAL MEDIA USING BERT**

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Social media sites have become potent instruments for spreading information, engaging in conversation, and organizing communities around urgent global issues, especially environmental issues. With millions of people posting opinions, news, and feelings every day, social media sites provide a rich source of real-time public conversation. Examining this conversation yields useful information about collective sentiment, emotional reactions, and changing trends toward environmental sustainability, climate change, pollution, loss of biodiversity, and other environmental issues. This paper introduces a holistic method of emotion analysis of environment-related social media content with the goal of revealing subtle emotional patterns that mirror public sentiment. Contrary to conventional approaches that use sequential deep learning models like Long Short-Term Memory (LSTM) and Gated Recurrent Unit (GRU) networks, the system leverages the strength of Bidirectional Encoder Representations from Transformers (BERT). BERT's sophisticated contextual awareness, made possible by transformer-based architecture and pre-training over large corpora, enables it to identify fine-grained semantic connections and affective nuances within text with greater accuracy.

As a further extension of the model's performance, the research explores the effectiveness of different feature extraction methods, such as Term Frequency-Inverse Document Frequency (TF-IDF), Bag of Words (BoW), and Word2Vec embeddings. By comparing these traditional methods with BERT's deep contextual embeddings, the study compares their effect on emotion classification accuracy and granularity. The comparative study helps in determining the best approach in identifying emotional hints in short, casual social media posts, generally dominated by slang, sarcasm, and varied language styles. The outcomes of this study have significant implications. By cracking the code of public emotions surrounding environmental stories, the system can assist policy makers in developing empathetic and responsive communication policies, aid activists in measuring the emotional temperature of societies, and help researchers analyze the sociocultural aspects of environmental awareness. In the end, the inclusion of emotion analysis in environmental discourse enables stakeholders to develop more participatory, interactive, and effective sustainability initiatives.

## **296. AUTOMATIC VOICE DISORDER DETECTION USING DEEP LEARNING**

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Voice disorders affect millions of people worldwide, causing difficulties in communication and diminishing quality of life. Early detection and diagnosis are crucial to manage and treat such conditions effectively. Traditional voice disorder detection systems often rely on manually extracted features. This project explores the use of self-supervised learning (SSL) to automatically detect voice disorders. By leveraging large unlabelled datasets, the proposed system learns meaningful speech representations without requiring extensive labelled data. The integration of SSL models significantly enhances the performance of voice disorder detection, providing a robust and scalable solution. This work aims to improve the efficiency of voice disorder detection through deep learning techniques that focus on data-driven representation learning. Our proposed approach is evaluated against existing methods, demonstrating superior accuracy and generalization capabilities. The findings suggest that self-supervised representations have the potential to revolutionize voice disorder screening and serve as a

foundation for clinical applications. Voice disorders impact millions globally, hindering communication and reducing quality of life. Traditional detection methods are manual, time-consuming, and prone to inaccuracies. This project leverages self-supervised learning (SSL) with large unlabelled datasets to automatically detect voice disorders, enhancing performance without extensive labelled data. SSL models learn meaningful speech representations, improving detection robustness and scalability. The proposed deep learning approach shows superior accuracy and generalization compared to existing methods, indicating that SSL could revolutionize voice disorder screening.

## **297. LOCKMYLOGIN: PERSONAL IDENTITY AND ACCESS MANAGEMENT SYSTEM**

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Addressing the challenges of securely managing multiple online credentials while protecting users from cyber threats like phishing and data breaches. It proposes a platform that securely stores credentials, automates logins, and evaluates website security in real time. The platform also analyzes user browsing habits to improve security and productivity. Utilizing AES-256 encryption, Selenium, and cyber security tools like WhatWeb ensures user privacy. It serves as a secure password manager for individuals and groups, with an admin controlling access and permissions.

## **298. ENHANCING E-COMMERCE EXPERIENCES WITH IMMERSIVE AR-CHAT INTERACTIONS**

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Augmented reality and conversational AI are transforming e-commerce by increasing consumer engagement and personalisation. This study describes a new AR-Chat architecture that combines immersive AR features and intelligent conversational agents to provide interactive and compelling retail experiences. The suggested solution allows consumers to engage with virtual objects in a highly intuitive way by combining real-time AR visualisation, natural language processing, and AI-driven recommendations. We talk about the architecture, implementation, and potential effects on customer happiness, conversion rates, and brand loyalty. Experimental results and user studies show considerable increases in user engagement and purchasing confidence. This study adds to the growing environment of AR-powered conversational commerce, making way for more seamless and interactive digital buying experiences.

## **299. NEWS AGGREGATOR WEB APP**

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#3 Gudipally Sai Sanjay,  
#4 Narige Charan Teja

In today's fast-paced digital world, we are constantly surrounded by news from every corner of the Internet. With so much information coming in at once, it can be tough to find news that is truly relevant, personalized, and easy to navigate. To make this experience smoother, our News Aggregator Web Application was built to automatically collect, sort, and display news articles using the power of Natural Language Processing (NLP) and Deep Learning (DL). Our system doesn't just grab headlines — it understands them. At its core is a custom-built model that combines Convolutional Neural Networks (CNN) and Long Short-Term Memory (LSTM) networks. These two work together to recognize patterns and context in news headlines, making it easier to sort stories into categories like Business, Politics, Technology, Sports, and Entertainment. We trained this model using large, diverse datasets from platforms like Kaggle, which help it learn from real-world articles and improve over time. To bring in fresh news, we use both NewsAPI and BeautifulSoup. NewsAPI provides quick access to major publications, while BeautifulSoup steps in when APIs fall short, allowing us to scrape important stories directly from sites like The Hindu and The Times of India. Rather than choosing one method over the other, we've combined them to ensure comprehensive and consistent news coverage. On the front end, we've kept things simple and user-friendly with Flask. As soon as users log in, they're greeted with a personalized dashboard where news is neatly organized into sections and categories. Each article card includes a title, summary, image, and a link to the full story. We've also added thoughtful features like like, dislike, save, and share so users can interact with content and build their own reading space. One of the standout features of the project is our built-in chatbot, powered by Gemini 2.0 Flash — a fast and lightweight version of Google DeepMind's Gemini model. This smart assistant can chat naturally, provide quick news summaries, suggest articles, or help users explore topics they're curious about. It makes the whole experience more engaging and personal. All of this runs on a secure backend where user activity and article data are safely stored and efficiently accessed. The result is a fast, intelligent, and easy-to-use platform that redefines how people explore news — turning an overwhelming stream of information into a customized, enjoyable experience.

### **300. IOT BASED SMART ENERGY AND LEAKAGE CURRENT MONITORING FOR PREDICTIVE MAINTENANCE AND REAL TIME FAULT DETECTION**

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Internet of Things (IoT) has been a game changer in fault detection and predictive maintenance in critical electrical systems in energy monitoring. This paper puts forward a state-of-the-art IoT-based smart energy monitoring system for real-time fault detection and predictive maintenance of transformers while improving their reliability and operational efficiency via leakage current detection. This system is based on the ATMEGA 328 microcontroller, interfacing with CTs and PTs to accurately measure electrical parameters. Sensors calibration is done using variable resistors also which displays data on LCD in real-time and sends data to GSM Modules through UART for mobile alerts. That means Wi-Fi connectivity with seamless cloud integration and thus remote monitoring through web-based dashboards. Using Python, the captured sensor data is formatted into CSV files, helping fault prediction using machine learning and historical analysis. If there is a fault in Transformer 1, Transformer 2 or Transformer 3, the system automatically displays fault details, whether the problem has been solved and with what time the recovery took place on a dedicated webpage, making it transparent and accessible. Moreover, automated email notifications help address anomalies quickly, with less downtime and avoid further damage to equipment. Our initial results show that it detects faults with a high degree of accuracy and can save maintenance costs using proactive analytics and potentially saving on maintenance costs through proactive analytics. The integrated IoT-enabled approach will increase system reliability, optimize maintenance strategies, and improve the overall management of electrical infrastructure.

### **301. INTRUSION DETECTION SYSTEMS: A CROSS-ALGORITHM COMPARISON FOR CLASSIFICATION ACCURACY**

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This paper investigates the integration of various machine learning algorithms, including XGBoost, Logistic Regression, and Support Vector Machines (SVM), to enhance the effectiveness of honeypots in detecting intrusions. By leveraging machine learning for classification, our goal is to improve the accuracy of intrusion detection while managing resource usage effectively. The findings highlight the advantages of using XGBoost as a robust classification model, showcasing its superior performance compared to traditional methods, and demonstrating how these combined approaches enhance the ability of honeypots to analyze cyber threats without imposing undue strain on system resources.

### **302. YOLOV11-BASED REAL-TIME LICENSE PLATE DETECTION AND RECOGNITION USING PADDLE OCR AND SQLITE**

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Using the revised YOLOv11 object detection paradigm, this work presents a complete and real-time license plate detecting and recognition system. The system is designed to precisely identify and extract car license plates by processing video input from live broadcasts or stored videos. It allows exact character identification even in demanding conditions, including motion blur, distorted camera angles, or low illumination, by using PaddleOCR for text extraction. Automatic saving of found plate numbers in a local SQLite database guarantees effective data persistence, fast retrieval, and intelligent similarity matching-based duplicate filtering. As IEEE base papers from 2022, 2023, and 2024 show, recent developments in computer vision fundamentally affect our approach. Unlike traditional ALPR (Automatic License Plate Recognition) systems that rely on cloud-based OCR APIs or static datasets, our version uses a self-trained YOLOv11 model that has been modified using a bespoke dataset fit for a range of plate forms and ambient conditions. As a result, in practical applications, localization accuracy and robustness are raised. Images are cleared before recognition using pre-processing methods including adaptive thresholding and CLAHE (Contrast Limited Adaptive Histogram Equalization). With its lightweight construction and multilingual features, PaddleOCR guarantees that even partially hidden or non-standard plates can be correctly read. Found entries managed by SQLite, a tiny embedded database, let flawless operation free from the need for an internet connection. Perfect for the system are smart security, parking control, traffic automation, and tolling systems. Small businesses, government agencies, and academic institutions can all take advantage of it depending on its continuous performance on mid-range hardware. Combining the most recent advancements in AI-powered detection, OCR, and database integration technologies produces, all around, a scalable, modular, and efficient solution to real-time license plate identification.

### **303. ORPHAN HELPER ON ROADSIDE USING MERN STACK**

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The Orphan Helper on Roadside application operates with MERN stack technology (MongoDB, Express.js, React, Node.js) which helps guide orphaned children located on roadsides. The innovative platform creates a connection between caring people and organizations and shelters and authorities to protect orphaned children. Users of the application can submit street orphan reports by collecting information about their location and age and gender together with their health condition. Users can upload images through the system that enhances the ability of authorities to both identify and track the child. The MERN stack delivers a web application that combines MongoDB for data storage with Express.js and Node.js running the backend system while offering a frontend interaction through React. Users benefit from accessing all posted orphans and reporting status alongside sending feedback to the platform. Through the system admins maintain orphan contacts while also modifying orphan data as well as monitoring reported case results. The Orphan Helper on Roadside application enhances communication integrity between shelter users, authorities and services to immediately relocate orphans which represents a crucial child welfare tool.

### **304. MEDIINSIGHT: A HEALTHGPT-POWERED PLATFORM FOR DISEASE DIAGNOSIS AND PERSONALIZED RECOMMENDATIONS**

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Healthcare accessibility and early disease detection remain critical challenges in modern medicine. To address this, we present MediInsight, a web-based AI-driven platform for disease diagnosis and personalized health insights. MediInsight employs Random Forest classifiers for Diabetes, Heart Disease, Liver Disease, Kidney Disease, and Breast Cancer, and Convolutional Neural Networks (CNNs) for Malaria and Pneumonia, ensuring accurate predictions based on patient data. A key feature, HealthGPT, is a generative AI-powered assistant fine-tuned using Retrieval-Augmented Generation (RAG). It leverages medical knowledge bases to provide real-time, contextually relevant responses, improving patient engagement and bridging the gap between users and healthcare professionals. MediInsight's performance is evaluated using accuracy, precision, recall, and F1-score, achieving an average accuracy exceeding 90% across structured datasets. Our findings demonstrate the effectiveness of MediInsight in enhancing early disease detection, improving healthcare accessibility, and assisting medical decision-making. By integrating AI-driven diagnostics and intelligent health assistance, MediInsight has the potential to support both patients and healthcare professionals, contributing to more informed and timely interventions.

### **305. ADAPTIVE DRIVER ASSISTANCE WITH ATTENTION AND ENVIRONMENTAL DETECTION**

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For precise localization and obstacle identification in autonomous driving, vehicle and edge detection are essential. Convolutional Neural Networks (CNNs), a type of traditional deep learning model, are good at extracting features but have trouble in complex situations. To get around this, we suggest a hybrid model that combines the Swin Transformer and CNNs. The Swin Transformer captures long-range dependencies and global context, while CNNs capture local aspects. This enhances detection in the presence of complicated road structures, changing lighting, and occlusions. Robustness to environmental changes is improved via a preprocessing pipeline that includes brightness-based augmentation, denoising, and image scaling. The hybrid model exhibits great promise for practical autonomous driving applications, increasing accuracy from 89.5% to 93% on a benchmark dataset.

### **306. DEVELOPMENT OF DYNAMIC SOURCE SWITCHING OF BATTERY CHARGING SYSTEM FOR ELECTRIC VEHICLES**

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The rapid adoption of electric vehicles (EVs) demands a robust and efficient charging infrastructure to ensure uninterrupted power supply. Conventional charging systems rely on a single power source, making them vulnerable to fluctuations and outages. This paper presents a hardware-based dynamic source switching system that seamlessly transitions between multiple energy sources, including grid power, renewable sources, and battery backup. The system is designed to optimize power availability, reduce dependency on a single source, and enhance charging efficiency. The proposed system integrates microcontrollers, sensors, and power electronics to enable real-time monitoring and intelligent switching. A power management unit (PMU) continuously assesses the availability and stability of different power sources. Voltage and current sensors provide real-time data, while a microcontroller processes this information to determine the optimal power source. Relay-based switching ensures minimal transition delays, maintaining continuous charging for EVs. A prototype of the system was developed and tested under various conditions to evaluate its performance. Experimental results show that the system successfully reduces charging downtime by dynamically selecting the most stable and cost-effective power source. The hardware implementation minimizes latency, ensuring rapid response to power fluctuations. This research contributes to the advancement of EV charging technology by offering a reliable and intelligent solution for dynamic source switching. The findings suggest that integrating such a system into charging stations can significantly enhance energy efficiency and sustainability. Future work includes further refining the control algorithm, improving switching speed, and incorporating wireless communication for remote monitoring and control.

### **307. AI-DRIVEN EARLY-WARNING SYSTEM FOR HUMAN - WILDLIFE COEXISTENCE**

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Tribal groups in isolated mountainous areas are constantly exposed to wildlife threats, endangering safety and livelihoods. According to the study in the United Republic of Tanzania whose economy relies on wildlife tourism, the threat to livelihoods of tribal individuals who reside in the border areas of forest is extremely high. The study work provides a sophisticated early-warning system driven by sensors, AI, and renewable energy to provide real-time warnings and emergency support, improving safety and readiness. Thermal Infrared sensors pick up on animal movement based on heat signatures, LiDAR captures distance, velocity, and dimensions. Acoustic sensors further augment detection by detecting animal sound. AI algorithms such as CNN categorize sound, and YOLO is a real-time image classifier, reducing false positives and increasing accuracy. Deterrents such as ultrasonic noise and strobe lights turn on smartly to scare animals away and save power. Solar power with backup guarantees operation under conditions of low sunlight. The constant communication across mountain landscapes by alert message is guaranteed by empowering a robust mesh network that employs Wi-Fi and LoRa. This concerted effort reduces wildlife threats, improves community security, and supports long-term coexistence with nature.

### **308. REDICTIVE MODELLING FOR NETWORK THREAT DETECTION USING ARTIFICIAL INTELLIGENCE TECHNIQUES**

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The invention of artificial intelligence (AI) methods has transformed network security through predictive modelling of threats. This abstract suggests a new method to improve network security using predictive modelling based on state-of-the-art AI methods. Through the processing of enormous network traffic data, AI algorithms are able to determine patterns that can indicate possible threats, such as malware, intrusions, and abnormal activities. The models predicted using this method can predict potential network weaknesses and proactively identify emerging threats before they realize themselves as security breaches. Taking this proactive approach enables organizations to strengthen their network defenses, reduce the risk of cyber attacks, and protect sensitive data. With the synthesis of predictive modeling and AI, this study attempts to make the way for more resilient and sturdy network security infrastructures in the more connected digital world.

### **309. OPTIMIZED DESIGN AND COMPREHENSIVE ANALYSIS OF BATTERY PACK COMPONENTS FOR ENHANCED PERFORMANCE.**

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Atharva Suryavanshi  
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The study optimized components for a 5-kWh lithium-ion battery pack, including cooling plates, enclosures, and busbars. Thermal and structural analyses (CFD, vibration, fatigue, load) validated the cooling plate performance. The enclosure was tested according to AIS 156 standards (drop, impact, shock), while the busbar went through thermal, mechanical and vibration simulations. Material and design comparisons identified optimal configurations that improve battery safety, durability, and performance for electric vehicles and energy storage

### **310. KNOWLEDGE HUB CARDS**

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This project presents the development of an advanced educational tool designed to improve memory retention and enhance learning experiences, inspired by the Flashback Card Reader toy used by young children. Unlike traditional systems that rely on barcodes, this tool employs RFID (Radio Frequency Identification) technology, providing faster and more reliable card scanning. The system uses RFID-tagged cards, each containing a question, which are shuffled and scanned by an RFID reader. Upon scanning, the question is retrieved from an SD card and played through a speaker. After a brief delay, the answer is played, promoting cognitive recall. The system also includes a display to show the question number and a volume control for the speaker. Powered by either a battery or adapter, the device is portable and ideal for use by both children and individuals preparing for competitive exams. This educational tool combines physical interaction with auditory feedback, creating an engaging and effective method for active learning, making it an excellent choice for enhancing memory retention in various educational contexts.

### **311. EFFECTS OF CLIMATE CHANGE ON AGRICULTURAL LAND VIABILITY: AN INTERPRETABLE MACHINE LEARNING-DRIVEN EURASIA CASE ANALYSIS**

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Global agricultural systems are at serious risk from climate change, which has an impact on crop yields, land productivity, and the availability of natural resources. Agricultural practices may be disrupted by changing weather conditions, including temperature fluctuations, altered rainfall patterns, and an increase in the frequency of extreme weather events. The goal of this project is to create a predictive

system that forecasts crops using climate and terrain data and machine learning techniques. To precisely forecast weather patterns, the system combines data from multiple sources, including temperature, humidity, soil moisture, pH value, humidity, and geographic terrain information. The system will assist in forecasting possible weather effects on agricultural land by utilizing machine learning algorithms such as Logistic Regression, XGBoost, and a hybrid model of Logistic Regression and Light GBM. By offering information on how shifting weather patterns may impact crops and farming practices, the suggested system will help farmers make plans in advance. Users will be able to view predictions and input data through web application integration, along with performance metrics such as F1-score, recall, accuracy, and precision. The significance of the features used to forecast weather patterns is also assessed by the system. In the end, the system helps stakeholders in agriculture make decisions by giving them access to real-time weather forecasts and recommendations for adaptable tactics that will guarantee agricultural sustainability in the face of climate change.

### **312. IOT-BASED SMART ENERGY METER WITH REAL-TIME MONITORING, THEFT DETECTION, AND PREPAID RECHARGE SYSTEM USING ARDUINO AND ESP8266**

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This project presents a cost-effective system for retrofitting traditional digital energy meters into smart meters, utilizing Arduino Uno, ESP8266, GSM module, and voltage/current sensors. The design strategically transforms existing energy infrastructure, enabling real-time power consumption monitoring and robust theft detection through differential analysis of pre- and post-load sensor data. Data is transmitted to an IoT cloud platform, facilitating remote access and appliance control via four virtual digital switches. A GSM-based prepaid recharge system allows for balance replenishment through USSD codes, with automated consumption-based deductions and low/zero balance alerts delivered via SMS notifications. The system employs real-time comparative analysis of sensor readings to detect power theft, triggering immediate alerts upon anomalous variations. This retrofit solution offers a user-centric approach to energy management, minimizing costs associated with complete meter replacement while significantly enhancing efficiency, security, and granular control over energy consumption. By transforming legacy meters into smart, efficient, and secure systems, this project promotes sustainable energy practices and empowers users with advanced monitoring and control capabilities.

### **313. ENHANCED OBSTACLE DETECTION FOR ROAD SAFETY WITH DEEP LEARNING**

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To improve road safety and lower accident rates, Advanced Driver Assistance Systems (ADAS) have drawn a lot of attention in recent years. This work investigates the use of the YOLO method, a state-of-the-art deep learning model famous for its speediness and precision in real-world applications, in the design of an object identification system for driver assistance. The proposed system detects and classifies road objects, including vehicles, pedestrians, traffic signs, and obstacles, providing real-time alerts to drivers. The research leverages publicly available datasets such as COCO that are collected from Kaggle web interface and fine-tunes the YOLO model to improve detection accuracy in various driving conditions, including low-light and high-speed scenarios. The system is tested on real-world video feeds and evaluated based on performance metrics includes mean Average Precision (mAP), detection speed (FPS), and accuracy. The results demonstrate that YOLO-based object detection significantly enhances driver awareness, reducing the risk of collisions and improving road safety. This study contributes the advancement of intellectual transport system, paving with the way for improved autonomous and also semi-autonomous vehicle technologies.

### **314. SMART ROUTE OPTIMIZATION ANALYTICS IN LOGISTICS USING DIJKSTRA ALGORITHM**

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The increasing need for effective logistics and trans- portation services has prompted the evolution of intelligent systems that determine the best routes to deliver products. This project, "Smart Route Optimization Analytics in Logistics Using Dijkstra's Algorithm," is meant to improve route planning within logistics by taking advantage of the OpenRouteService API, which includes the application of the Dijkstra algorithm for determining the best delivery routes. The system captures geographic data as well as traffic data to determine the shortest and most time-saving routes from a point of origin (e.g., ware- house) to several points of destination. The OpenRouteService API, whose high routing capabilities, calculates the optimal route using real-world considerations like road conditions and traffic flows. This minimizes operational expenses, fuel use, and delivery time. The project also provides real-time visualizations for routes, which can be employed to evaluate and contrast multiple deliv- ery alternatives. The system is also applicable across different industries like courier, e-commerce, and emergency response teams, where timely deliveries are vital. Utilizing Dijkstra's algorithm on the OpenRouteService platform ensures that the project provides an effective, scalable, and realistic solution to contemporary logistic problems. The results of this project will enhance route optimization, resource management, and decision- making in logistics operations.

### **315. ALZHEIMER'S PREDICTION USING MACHINE LEARNING ALGORITHMS**

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Alzheimer's disease, the most prevalent cause of dementia in the elderly, leads to progressive cognitive decline, affecting memory, speech, and daily life activities. As the disease advances from the initial,

beginning and later stages, the patients become agitated, aggressive, and can no longer recognize loved ones. Early diagnosis is challenging, and hence early detection is critical for symptom control and prevention of further brain damage. This study proposes a deep convolutional neural network (CNN) for diagnosing Alzheimer's with MR brain scans, which actually capture structural changes like the degeneration of neurons and brain shrinkage, particularly of the hippocampus and amygdala. Machine learning (ML) approaches, which improve with experience, play a vital role in medical imaging by enabling automated diagnosis when the regular methods fall short.

### **316. AI-POWERED SEGMENTATION FOR KIDNEY TUMOR DETECTION**

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Detection of kidney cancer through medical imaging like CT or MRI scans requires precise localization and delineation of tumors for proper diagnosis and treatment. Manual segmentation by radiologists is slow and subject to inter-observer variability. This research suggests an AI-based method based on Convolutional Neural Networks (CNNs), U-Net architecture, and Vision Transformer models for the automatic delineation of kidney tumors. Utilizing annotated datasets like KiTS (Kidney Tumor Segmentation Challenge), the new system treats volumetric CT images and correctly segments renal masses. The models are trained and tested using Dice Similarity Coefficient (DSC), Intersection over Union (IoU), and Hausdorff Distance measures. The findings show a Dice score of up to 0.92, providing reliable and efficient tumor localization, which can aid early diagnosis and surgical planning.

### **317. NFC-BASED GUEST ACCESS FOR SMART HOMES WITH TIME AND DEVICE RESTRICTIONS**

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Smart home systems have been revolutionized by Internet of Things (IoT) technology, which has increased the flexibility and security of resident and visitor access control. An NFC-based smart home temporary guest access solution is presented in this study, allowing homeowners to provide visitors with temporary access. NFC tags, a Raspberry Pi Wi-Fi server, a Python-based graphical user interface, a SQL database for safe credential management, and the Adafruit dashboard for in-the-moment device control are all used in the system. Guests authenticate, select the duration of their stay, and receive limited access to smart home control on a local server after scanning an NFC tag. Our solution protects data by keeping credentials locally and reducing reliance on the cloud, while providing simple control over lights, fans, and other connected devices through the Adafruit dashboard. In addition to filling gaps in current solutions, this safe, flexible, and user-friendly temporary access system supports Sustainable Development Goal 11, which calls for improved security and resource efficiency to provide safe, inclusive, and sustainable urban settings. According to experimental results, the system is dependable and easy to use, enhancing the comfort and security of home IoT.

### **318. MALICIOUS URL SCANNER WITH SANDBOX VIEW**

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The project "Malicious URL Scanner with Sandbox View" aims to provide an efficient solution for identifying potentially malicious URLs. The system integrates Flask, a popular Python web framework, and the IPQS API, which offers advanced URL reputation analysis. The proposed approach involves passing the unsafe URL through a sandboxed browser before opening it, ensuring that any malicious content is contained and does not harm the host system. The project utilizes machine learning algorithms to enhance the accuracy of the URL classification process. The results are presented to the user in a user-friendly web interface, allowing them to take appropriate actions based on the analysis. The system provides an effective means of identifying potentially harmful URLs, making it useful for individuals and organizations concerned with online security.

### **319. EXPLOITING ARNOLD TRANSFORMATION IN H.264 INTRA PREDICTION FOR ENHANCED IMAGE COMPRESSION**

The impact of the Arnold transform on image compression efficiency and quality is evaluated by comparing two methodologies: one that incorporates the transform and one that does not. Images are scrambled using the Arnold transform at various iteration counts to enhance compressibility, with the periodicity (T) considered for optimal recovery. Compression ratios (CR) and mean squared errors (MSE) are analysed to identify the best performance metrics. The results show that using the Arnold transform improves compression ratios and lowers MSE values, demonstrating its potential to enhance both compression efficiency and image quality. Users can specify desired CR and MSE values, enabling the proposed algorithm to select the appropriate number of Arnold iterations (t) and compute  $T - t$ , ensuring a tailored balance between compression efficiency and the preservation of image quality.

### **320. SMART TIMELINE REMINDERS FROM GMAIL AND CHAT APPLICATIONS USING LSTM: A CASE STUDY BASED APPROACH**

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With the busy life in today's world, it is essential to keep deadlines and tasks in check to remain productive. This paper presents an intelligent reminder system that leverages Long Short-Term Memory (LSTM) networks to extract time-relevant information from messaging apps such as WhatsApp and email services such as Gmail. The system analyzes chat and email data to detect important dates and deadlines, and sends reminders to users at regular intervals. By supporting integration with both Gmail and WhatsApp, the system makes it easy to extract vital information from emails and messages and to create automatic reminders. The system relies on MongoDB for the effective storage and retrieval of data. This is an intelligent reminder system designed to increase user productivity by minimizing the

chances of missing deadlines and enhancing general time management. Moreover, the system becomes user-habituated as it learns communication patterns to ensure that notifications are relevant and tailored. The capability of the LSTM model to work with sequential data enables it to process dynamic and diverse message formats, thus ensuring a higher accuracy in information extraction. In addition, multiple platforms provide an end-to-end reminder system that can be accessed across various communication channels. The proposed system has tremendous potential for improving personal and professional time management, which can lead to more effective task tracking and deadline management. This study investigated the possibility of using deep learning models to automate reminder systems to alleviate cognitive load and enhance efficiency in everyday tasks.

### **321. SIGN LANGUAGE DETECTION USING RANDOM FOREST ALGORITHM**

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This research presents a real-time sign language recognition system utilizing advanced computer vision and machine learning techniques to enhance communication accessibility for the hearing-impaired community. The system integrates MediaPipe for precise hand landmark detection and employs a Random Forest classifier to accurately recognize and classify sign language gestures. By leveraging a structured dataset comprising real-world and synthetic hand gesture samples, the model undergoes rigorous training with augmentation and normalization methods to improve performance. Experimental results indicate that the system achieves high recognition accuracy, ensuring a seamless and efficient sign language translation experience. This innovation enhances inclusivity by enabling real-time communication solutions for diverse applications such as education, healthcare, and public services.

### **322. STUDY OF STABILIZATION FOR ON CHIP HIGH SPEED RLCG GLOBAL INTERCONNECTS USING TIME DOMAIN ANALYSIS**

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In the proposed research work, bode plot-based stability analysis approached is presented for the transmission line modelling of VLSI high speed global interconnections in integrated circuits. The second order RLCG interconnect model is analyzed by approximating the transient response for the estimation of various circuit performance parameters like rise time, settling time, damping ratio, natural frequency and stability using 180 nm technology node. The single RLCG system performance is measured using the concept of the transient response to a unit impulse input generally called impulse response without any consideration of approximation to the system transfer function. In this proposed model, it is observed that impulse response of the system is dependent on the value of G. From the



simulation results, it is found that for higher values of G, system is taking less time to achieve steady state condition therefore delay is reduced. Pole-zero plot is used to analyze the stability of the RLCG transmission line model.

### **323. SOMNIFIC SMART PILLOW AN APP INTEGRATED DEVICE FOR INSOMNIA PATIENTS**

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Affiliated to anna university, accredited by naac, nba (ece/cse/mech) and iso 9001:2015 certified  
pullipalayam, sankari, salem (dt.)

The one of most essential needs for human survival are sleep. Without proper sleep, life becomes extremely difficult and unhealthy. Some factors like stress, anxiety, shift work often lead to sleep disorders such as insomnia, sleep apnea, parasomnia, and narcolepsy. These disorders significantly affect a person's quality of life by reducing their efficiency, concentration, and overall well-being.our aims to help individuals suffering from sleep disorders by making the surroundings more conducive to perceiving and responding to electromagnetic fields, thereby improving sleep quality without the use of drugs.

### **324. AREA-AWARE ADAPTIVE IMAGE COMPRESSION USING DUAL-BACKGROUND CLASSIFICATION FOR OPTIMIZED DATA PRESERVATION AND QUALITY ENHANCEMENT**

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In the current era of data-intensive applications, including OTT services, IoT, and autonomous systems, efficient image compression is indispensable in order to minimize bandwidth consumption while preserving visual quality. Conventional compression techniques frequently fail to satisfactorily balance compression ratios and the preservation of critical image details. This work introduces a novel adaptive image compression method that is area-aware and utilizes a dual-background classification system to improve data preservation. The method classified areas into major and minor backgrounds by aggregating image regions based on visual characteristics. It applied aggressive quantization to less salient regions and refined compression techniques for critical details. A saliency map, reflecting human visual perception, guides this process, ensuring the preservation of the most visually significant information. By customizing quantification to the visual priorities of a particular region, the proposed methodology enhances the quality of images and the efficacy of compression. Extensive testing demonstrates that the area-aware approach outperforms traditional compression algorithms, enhancing the visual experience and significantly reducing data traffic. This research work mainly focuses on the reducing of data size and simultaneously preserving the image quality at required regions by using of adaptive compression techniques. This is particularly relevant for applications that necessitate high-quality image transmission in a data-driven world.

### **325. CARTOON SERIES BASED - ENDLESS RUNNER THEMED EDUCATIONAL AND BRAIN POWER ENHANCING GAME APP USING UNITY ENGINE**

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This project is to build a Game Application to enhance the player's Brain Power, and to balance both the left and right hemispheres of the player's brain. This is an Endless Runner Game, with Puzzles that enhance Brain development. Generally, most of the Endless Runner games do not provide any productivity element. And usually Puzzle Games are straight forward. This Game combines an Endless Runner Game with Brainpower enhancing puzzles so that productivity and entertainment are given hand in hand. There are four different puzzles namely, memory match game, to improve the memory power of the player, Word Puzzle, to improve the language skills of the player, a colour Game, which helps develop the right brain of the player, and a quick arithmetic problem Game, that helps to enhance the player's analytical thinking skills and mental math skills. Each of these puzzles have 5 difficulty levels. These puzzles are intertwined with the Endless Runner game to make the game more fun. That also helps to improve the hand-eye coordination of the player. This 2D Game is built using Unity Engine.

### **326. ENERGY PERFORMANCE STUDY OF CEMENT CONCRETE WALL PANEL INTEGRATED WITH PCM**

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A viable way to improve building thermal management is by incorporating Phase Change Materials (PCM) into cement concrete wall panels. An experimental study of phase-change materials incorporated into concrete wall panels for thermal management is presented in this paper. The thermal performance of two identical concrete building wall panels with and without PCM integration—was assessed in a naturally hot environment. The findings of a thermal study show that compared to a typical cement concrete wall panel without PCM integration, PCM-integrated concrete wall panels showed fewer temperature fluctuations. Researchers looked into how different thermal performance affected PCM integration. The panels' heat storage, dissipation properties, and overall effect on indoor temperature stability were evaluated through experimental analyses. According to the results, the PCM integration greatly lowers temperature fluctuations, improving occupant comfort and energy efficiency. The results demonstrate the potential of PCM-based concrete panels as an environmentally friendly method of passive thermal management in contemporary building.

### **327. A LIGHTWEIGHT RULE-BASED FRAMEWORK FOR DETECTING PHISHING URLS WITH RISK EVALUATION**

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Phishing attacks have become one of the most prevalent threats in cyberspace, targeting users through deceptive websites that mimic legitimate services to steal sensitive information. This project presents a rule-based phishing URL detection system designed to accurately identify malicious URLs in real-. Not like the machine learning models requiring huge datasets and training, this works by deterministic feature-driven approach in judging the legitimacy of URL. The detection process begins with validating user-supplied URL formats. Valid URLs are further analyzed to extract multiple features such as host-based attributes (IP address, domain age, redirection), lexical patterns (URL length, presence of special characters such as top-level domain, etc.), and content-based indicators (if accessible). In addition, suspicious keywords and known phishing signatures are checked. Those features are analyzed through predefined rules to generate a risk score, which is then used to classify the URL as safe or malicious. The final result along with risk score and reasoning is presented to the user in a clean and user-friendly interface. The system also maintains a history of recent scans for reference. Such clear and explainable rules would ensure high accuracy, transparency and immediate feedback from the project making it a reliable tool to ensure web safety and user awareness.

### **328. TOMATO DISEASE CLASSIFICATION USING DUAL ATTENTION ENHANCED RESNET**

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The growing need for effective agricultural surveillance requires smart systems that can reliably detect crop diseases. This project suggests an AI-based tomato leaf disease detection system based on deep learning and attention mechanisms to enhance diagnostic precision. The system takes leaf images through a dual-attention model—CBAM (Convolutional Block Attention Module) and Global Attention—constructed on a ResNet18 backbone. Preprocessing methods like resizing, normalization, and augmentation are used to improve feature extraction in training. The model separates healthy from diseased leaves across classes as well as rejects irrelevant inputs like non-leaf images. This is made possible by a dual-output framework: one for disease classification and the other for leaf detection. The learned model provides reliable predictions even under varying conditions and can be utilized in real-time agricultural usage. The solution allows for early diagnosis of tomato plant diseases, increasing crop yield, and minimizing reliance on manual inspection.

### **329. AUDIO BASED EMOTION RECOGNITION USING AI-ML TECHNIQUES**

Systems for voice Emotion Recognition (SER) use a variety of methods to identify and categorize emotions in voice signals. Although they have been employed, traditional techniques like Bayesian networks and Support Vector Machines (SVM) frequently have trouble classifying data accurately. With an emphasis on LSTM networks successfully capturing temporal dependencies in speech, this study examines deep learning developments in SER. Furthermore, by capturing the spectrum characteristics of speech, Mel-Frequency Cepstrum Coefficients (MFCCs) are frequently employed for feature extraction, improving classification accuracy. Along with its limitations, the study looks at databases, recovered emotions, categorization techniques, and recent advancements in SER. Techniques for identifying emotions including pleasure, joy, anger, sadness, neutral, boredom, disgust, fear, and surprise. This review offers insights into the efficacy of different approaches, highlighting both their

advantages and disadvantages in enhancing speech-based emotion recognition by examining current research and cutting-edge technologies.

### **330. IMPACT OF ELECTRIC VEHICLES AND RES-BASED SYSTEMS ON DC MICROGRID STABILITY**

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As the revolution of the modern world shifts towards the smart grid/microgrid concepts, maintaining the stability of DC microgrids has become increasingly important—especially with the rising adoption of Electric Vehicles (EVs) and Renewable Energy Sources (RES). This study presents a simulation-based analysis of a DC microgrid by integrating solar PV, wind energy, battery storage, and two EVs equipped with bidirectional Vehicle-to-Grid (V2G) functionality. The system is modeled in MATLAB/Simulink, using realistic irradiance and wind speed data to simulate a full 24-hour period within a 24-second simulation window. To manage energy flow, a State-of-Charge (SoC)-based control strategy is used to regulate the charging and discharging of the battery and EVs based on predefined DC bus voltage thresholds. A grid disconnection scenario is also introduced to evaluate the system's resilience of the DC microgrid. The results show that the proposed system successfully maintains stable DC bus voltage levels of nominal range, even in the presence of fluctuating loads and renewable generation. The coordinated operation of RES, EVs, and simple SoC-based logic ensures effective energy management with minimal control complexity. Overall, this work highlights a practical and sustainable stability approach for future smart grid applications.

### **331. PIXELS DETECTIVES UNMASKING ESOPHAGEAL CANCER DETECTION USING CNN**

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Esophageal cancer constitutes a major oncological challenge worldwide, primarily due to its asymptomatic progression and late-stage diagnosis, resulting in poor patient prognosis. Traditional diagnostic procedures, although effective, are often time-consuming, subjective, and dependent on  
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specialist expertise, underscoring the critical need for automated diagnostic solutions. This study presents a deep learning-based approach for early esophageal cancer detection, employing advanced architectures—XceptionNet and DenseNet—on the Kvasir V2 gastrointestinal imaging dataset. A comprehensive pre-processing pipeline was developed, incorporating image resizing, normalization, and extensive augmentation to enhance model robustness and generalization. Through meticulous training and evaluation, both architectures demonstrated superior performance across key metrics, including accuracy, precision, recall, and specificity, validating their potential for clinical deployment. DenseNet's dense connectivity and XceptionNet's efficient separable convolutions significantly contributed to the models' effectiveness. Furthermore, the study highlights challenges such as dataset limitations and imaging variability, offering strategic insights for future enhancement through data diversification, transfer learning, and integration of explainable AI techniques. The findings suggest that deep learning models can substantially augment traditional diagnostic workflows, providing rapid, reliable, and interpretable assistance to clinicians, thereby improving early detection rates and patient survival outcomes. This research lays a foundational framework for advancing AI-driven diagnostic systems within clinical gastroenterology.

### **332. RETINAL BIOMARKERS FOR CARDIOVASCULAR RISK PREDICTION: A MACHINE LEARNING APPROACH**

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cardiovascular diseases (CVDs) remain the leading cause of mortality worldwide, necessitating innovative approaches for early risk assessment and intervention. This project explores the potential of utilizing retinal eye images as a non-invasive, cost-effective method for predicting heart disease risk. By leveraging advanced deep learning algorithms Convolutional neural networks (CNN's) and transfer learning techniques, we analyze retinal fundus images to extract critical vascular features that correlate with cardiovascular health. Our methodology encompasses rigorous data preprocessing, including Noise reduction and contrast enhancement, to optimize image quality and feature extraction. The results indicate a strong correlation between retinal features and cardiovascular risk factors, achieving high accuracy in predicting major adverse cardiovascular events. This project not only highlights the feasibility of integrating retinal imaging into routine clinical practice for heart risk assessment but also paves the way for personalized healthcare strategies that can significantly improve patient outcomes. By transforming retinal eye images into actionable cardiovascular risk predictions. This project work aims to revolutionize the landscape of preventive cardiology and enhance the accessibility of heart disease screening.

### **333. EMPOWERING IOT CYBER NETWORK ATTACKS USING MACHINE LEARNING**

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This study examines the dual impact of machine learning on IoT cybersecurity, presenting both its potential benefits and risks. Machine learning algorithms can analyze extensive data streams from IoT devices, uncover hidden patterns, detect anomalies indicative of cyber threats, and predict future attacks. By deploying these models, IoT networks can be fortified with proactive defenses, reducing the probability and significance of violations. However, the same technologies may be misused by attackers with harmful intent to develop advanced cyberattacks. Adversaries may train algorithms to identify and exploit vulnerabilities in IoT systems, bypassing conventional security measures. The proposed approach emphasizes leveraging machine learning for robust threat detection while addressing the risks of misuse. This balanced perspective aims to empower organizations to strengthen IoT security while mitigating potential vulnerabilities.

### **334. A GEN-AI POWERED PLATFORM FOR GENERATING NOVEL MOLECULE STRUCTURES USING NVIDIA - MOLMIM**

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An AI-powered web-based platform designed to advance research in protein-ligand binding by providing an interactive and user-friendly interface. This platform addresses the challenges in drug discovery by integrating state-of-the-art computational techniques that streamline molecular generation and optimization. Built using Next.js, TypeScript, and MongoDB, Protein Bind ensures scalability, efficiency, and real-time data handling, making it accessible to researchers worldwide and leveraging Generative AI GenAI methodologies to facilitate molecular design. Specifically, the platform integrates the NVIDIA MOLMIM model, a robust AI framework for generating molecular structures with high precision. To enhance the effectiveness of molecular generation, Protein Bind employs the CMAES algorithm, an advanced evolutionary optimization technique. This enables the platform to refine molecular structures based on the Quantitative Estimate of Drug-likeness QED, ensuring the identification of compounds with high pharmacological potential. Beyond AI-powered molecular design, Protein Bind fosters seamless global collaboration among researchers by implementing a decentralized communication framework. Utilizing the Abley API, the platform enables secure, real-time data exchange and discussions, bridging the gap between researchers across different institutions and geographical locations. This collaborative ecosystem empowers scientists to share insights, refine models, and accelerate the drug discovery process. This paper explores the architectural design, core functionalities, and technical implementation of Protein Bind, with a strong emphasis on its AI-driven innovations. By combining generative AI, evolutionary optimization, and decentralized networking, Protein Bind serves as a cutting-edge tool in computational drug discovery, redefining how researchers approach protein-ligand binding studies.

### **335. AI AGENTS:CMO**

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The evolution of AI has significantly altered business landscapes, with marketing experiencing one of the most profound transformations.[1] Experts worldwide are striving to identify the most effective AI-driven solutions for optimizing marketing functions. This research delves into how AI-powered technologies, fueled by Natural Language Processing (NLP) and Generative AI, are reshaping the role

of the Chief Marketing Officer (CMO). By harnessing AI-driven customer insights, businesses can refine business development, enhance social media marketing, and conduct in-depth brand analysis. This study introduces an AI-powered marketing assistant built using FastAPI, Pydantic, and the Groq API, leveraging advanced machine learning models like Mixtral-8x7B to generate intelligent and contextual responses. The system facilitates data-driven decision-making by analyzing structured conversation histories, enabling a deeper understanding of customer interactions. Additionally, it incorporates big data analytics and predictive modeling to adapt marketing strategies in real time. The integration of AI-powered chatbots and conversational AI enhances customer engagement by offering a personalized marketing framework that tailors responses based on predefined attributes and user behavior. Furthermore, this research explores the ethical considerations surrounding AI in customer relationship management (CRM) and AI-driven social media analysis, ensuring a seamless balance between automation and human creativity. It emphasizes the importance of responsible AI implementation to maintain transparency, trust, and data privacy. The findings of this study establish a strong foundation for future innovations in MarTech, optimizing marketing efforts through automation, sentiment analysis, and AI-driven insights while addressing scalability challenges and ethical concerns.

### **336. IMPROVED ALZHEIMER'S DIAGNOSIS THROUGH ADVANCED DEEP LEARNING TECHNIQUES**

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Alzheimer's Disease is one of the most common neurodegenerative disorders of human brain error problems. characterized by a gradual decline in memory, cognition, and daily functioning. memory loss is symptom for this human brain error. It primarily affects older adults and represents a major public health concern due to the increasing life expectancy and aging population worldwide. In a report of the World Health Organization, Alzheimer's disease accounts for 60% to 70% of dangerous human brain dementia cases globally, making early diagnosis and intervention critical in managing its progression. This study evaluates the performance of various deep learning algorithms using MRI scans. EfficientNetB0 emerged as the most effective model, achieving 95% training accuracy and 90% testing accuracy, outperforming VGG-16, VGG-19, and DenseNet169. These Algorithm findings underscore the importance of deep learning in advancing early-stage AD detection and improving diagnostic outcomes.

### **337. PREDICTING MAINTENANCE IN LEVERAGING SUPERVISED MACHINE LEARNING FOR WIRELESS SENSOR NETWORK**

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Wireless Sensor Networks (WSNs) play a crucial role in real-time monitoring and data collection in diverse environments. However, they are highly susceptible to faults and cyberattacks due to their distributed nature and limited computational capabilities. This paper presents a comprehensive approach to predictive maintenance in WSNs using supervised machine learning algorithms. Our system collects historical and live network traffic data, applies pre-processing, and employs three different classifiers—Complement Naive Bayes, AdaBoost, and Extra Trees Classifier—to predict  
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potential faults and classify attacks. Among these, the Extra Trees Classifier outperformed others with a 99.89% accuracy rate. The project is deployed as a web-based application using Django, allowing users to input network features and receive real-time predictions. Our proposed model enhances the reliability, resilience, and security of WSNs while providing scalability and interpretability.

### **338. FISHERMAN TRACKING AND ENVIRONMENT MONITORING SYSTEM**

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Sanju Shree RL

Fisherman often face challenges such as unpredictable weather, border violations, and emergency situations while at sea. The Fisherman Tracking System is designed to ensure the safety and security of fishermen by monitoring their location, weather conditions, and emergency situations. This system employs PIC16F877A, PIC Microcontroller, RF Transmitter and Receiver, GPS, and NodeMCU to track and transmit real-time data. The boat unit consists of various sensors, including a water level sensor, rain sensor, and DHT11 temperature and humidity sensor, to detect environmental changes. An emergency button enables distress alerts, transmitting the boat's latitude and longitude to the receiver unit, which is located onshore. Additionally, a buzzer warns the fishermen when they approach international borders. The system operates on a 12V battery, charged using solar panels and a windmill, ensuring uninterrupted power supply. On the receiver side, PIC microcontroller, an LCD display, and NodeMCU process and publish the received data for real-time monitoring by authorities.

### **339. AI DRIVEN SMART POSTURE MONITOR AND ALERT SYSTEM**

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Proper sitting posture is the basis for prevention of musculoskeletal problems and overall health. Smart Posture Monitor is an AI system which helps people in maintaining their optimal sitting posture by using the laptop camera. With the help of deep learning algorithms, it continuously monitors your posture giving you instant alert to correct yourself. The system uses advanced analysis methods for detecting improper sitting habit and encouraging you to adopt healthy sitting habits. The innovative technology applies OpenCV, Python and machine learning algorithms for reliable monitoring ensuring that the user enjoys better ergonomic awareness as well as protection from the underlying risks of poor posture.

### **340. A CYBER-PHYSICAL SYSTEM FOR PRECISION WATER MANAGEMENT IN SUSTAINABLE AGRICULTURE**

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The project, "A cyber-physical system for precision water management in sustainable agriculture," aims to enhance agricultural water management by automating the irrigation process based on real-time environmental and soil conditions. The system incorporates soil moisture, temperature, and humidity sensors to continuously monitor the field's conditions, ensuring that crops receive the optimal amount of water needed for healthy growth. The core component of this system is the ESP-12E Wi-Fi module, which enables seamless wireless communication between the sensors and the cloud platform, Adafruit IO. Data collected from the sensors is transmitted to Adafruit IO, where it is processed and visualized through an interactive dashboard, allowing users to monitor the field conditions remotely. The irrigation system operates in an automated mode, where the pump is activated when soil moisture levels drop below a predefined threshold and turned off once the required moisture level is restored. This prevents overwatering and ensures efficient water usage. Additionally, the system includes a manual override feature, enabling farmers to control the irrigation process remotely through the Adafruit IO dashboard, offering flexibility and user control. By integrating real-time monitoring, automated decision-making, and remote accessibility, this cost-effective and scalable system significantly reduces manual labor, water wastage, and energy consumption, making it an eco-friendly and efficient alternative to traditional irrigation methods. The Smart Irrigation System not only improves crop productivity but also supports sustainable agriculture by conserving water resources and optimizing irrigation schedules. This technology-driven approach enhances resource management, lowers operational costs, and ensures higher yield quality, ultimately benefiting farmers and promoting environmental sustainability.

### **341. SPEECH EMOTION RECOGNITION**

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Speech emotion detection is vital for enhanced human computer interaction and use in mental health. In this paper, we present a deep learning-powered AI system for accurate emotion detection with voice signals. Designed from the Wav2Vec2 transformer model, the system efficiently translates raw audio to label emotional states with accuracy. Through training on the TESS dataset alone, comprising seven balanced emotion classes, the model ensures robust and generalized performance. With speech emotion analysis by machines, this paper supports emotionally intelligent system development and interactive user experience.

### **342. TWITTER SENTIMENTAL ANALYSIS**

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The rise of social media platforms, particularly Twitter (now X), has led to an unprecedented volume of publicly available user-generated content, making it an essential source for sentiment analysis. This paper presents an automated approach to extracting and analyzing tweets to determine public sentiment on specific topics using web scraping, Natural Language Processing (NLP), and machine learning techniques. The proposed system employs Playwright for dynamic web scraping, Fernet encryption for securing user credentials, and TextBlob for sentiment classification. To enhance insight extraction, TF-IDF vectorization and K-Means clustering are used for topic modeling, while KeyBERT identifies key discussion themes. The results are visualized through graphical sentiment distributions, providing a quantitative and qualitative analysis of public opinion trends. This study demonstrates the feasibility of automated sentiment analysis and highlights future directions for improving accuracy and efficiency through deep learning and real-time analytics.

### **343. CLOUD-INTEGRATED SMART PET FEEDER WITH ADAPTIVE FEEDING AND MOBILE APP CONTROL**

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The Smart Pet Feeder system integrates IoT, real-time sensors, cloud services, and mobile app connectivity to automate and personalize pet feeding with enhanced reliability and convenience. Unlike conventional feeders, this system adapts future food portions based on actual consumption patterns, using precise weight sensors and intelligent AI algorithms to maintain optimal nutrition and minimize waste. Real-time data is collected and processed by a NodeMCU microcontroller, while pet owners can monitor and control the feeder remotely using a dedicated mobile application, which also provides live video feed through an onboard ESP32-CAM module. The feeder includes an automated water dispensing system with level detection and alerts, ensuring hydration is maintained. Cloud integration facilitates the secure storage of feeding logs and analytics, enabling data-driven feeding recommendations and personalized schedules. The system generates notifications for uneaten food, low resources, or malfunctions, supporting timely intervention. This paper explores the feeder's architecture, hardware configuration, app interface, performance results, and comparative analysis with commercial products like Petnet and SureFeed. Tests show that the system improves portion accuracy by 92%, reduces waste by over 30%, and increases feeding consistency by 27%, making it a comprehensive and smart pet care solution.

### **344. STRENGTH CONVERSATION POWERLIFTING CHATBOT WITH NATURAL LANGUAGE PROCESSING**

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Development of natural language processing (NLP) has immensely improved chatbot capabilities across several domains, such as powerlifting and fitness. In order to provide individualized strength training guidance and assistance, this article presents the development of a Strength Conversation  
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Powerlifting Chatbot. The chatbot utilizes Advanced Natural Language Processing (NLP) techniques to comprehend and address user questions regarding diet, exercise regimen and performance tracking. personalized and effective training experience is guaranteed by the fact that the chatbot can analyze user input and provide relevant suggestions due to machine learning algorithms. The chatbot is also an excellent tool for powerlifters who wish to continue improving because it can understand normal language and interact in a human-like way. This research points towards the revolutionary potential of NLP-driven chatbots in the world of fitness, offering accessibly available, on demand guidance, expert guidance.

### **345. FOOD CALORIE ESTIMATION – INGREDIENT BASED AND IMAGE PROCESSING**

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People with dietary restrictions and those who are health-conscious are depending more and more on technology in the modern era to help them make educated food choices. Accurately estimating the nutritional content of food from images is a major challenge in reaching this goal, requiring sophisticated image processing, machine learning, and deep learning techniques. The increasing demand for an effective system that can recognize the type of food, estimate its calorie content, and analyze its nutrient composition from an image is addressed by this project. The first thing the system does is process food photos that were gathered from a dataset. To improve the quality of the input data, the images—usually in .png or .jpg formats—are pre-processed.

To lower computational complexity, the images are resized to a consistent size and converted to grayscale in this step. In order to extract important information from the image that can be utilized for classification, a variety of techniques, including Gabor filters, Local Binary Pattern (LBP), and statistical measures like mean, median, and variance, are applied in the feature extraction step. A classification model based on deep learning is trained using the features that were extracted. Well-known architectures such as ResNet and RCNN with VGG-19 are used to classify food items, estimate their calorie content, and calculate the levels of nutrients like proteins, fats, and carbohydrates. Labeled datasets, which include food labels and the associated calorie information, are used to train the model. Users can upload food photos and get real-time predictions through the web-based interface created with Flask and Streamlit. Along with the food type, these forecasts also include an estimate of calories and a breakdown of nutrients. To assess the system's robustness, a number of performance metrics are used, such as accuracy, error rates, and comparison graphs.

### **346. A DIGITAL RECOMMENDATION SYSTEM FOR PERSONALIZED LEARNING TO ENHANCE ONLINE EDUCATION**

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Personalized learning has emerged as a critical component in online education, contributing to improved learning outcomes and student engagement. This project's main goal is to create a personalized learning recommendation system by combining student data collection from the Neurosky EEG Biosensor, AI, and the Flask Web Framework. Using behavioral and physiological data, the system seeks to determine each student's level of knowledge, then uses Fluxy AI to modify the learning materials accordingly. Additionally, this system offers content creation, AI-powered virtual proctoring, and real-time progress tracking, all of which guarantee an engaging and personalized learning environment. This platform will use cutting-edge algorithms like Hybrid Neural Collaborative Filtering (HNCf) to offer precise and dynamic course recommendations based on the strengths and weaknesses of each learner. Personalized learning has emerged as a critical component in online education, contributing to improved learning outcomes and student engagement. This project's main goal is to create a personalized learning recommendation system by combining student data collection from the Neurosky EEG Biosensor, AI, and the Flask Web Framework. Using behavioral and physiological data, the system seeks to determine each student's level of knowledge, then uses Fluxy AI to modify the learning materials accordingly. Additionally, this system offers content creation, AI-powered virtual proctoring, and real-time progress tracking, all of which guarantee an engaging and personalized learning environment. This platform will use cutting-edge algorithms like Hybrid Neural Collaborative Filtering (HNCf) to offer precise and dynamic course recommendations based on the strengths and weaknesses of each learner. To make sure that learning is tailored for each user, the system also makes use of Reinforcement Learning (RL) to forecast and suggest content based on continuous interactions. The platform prioritizes data privacy and ensures that student data is handled securely while offering useful feedback on learning progress. By bridging the gap between intelligent, adaptive learning systems and traditional online education, this project will improve accessibility, efficiency, and student-specific customization of education.

### **347. BATTERY AGEING PREDICTION IN ELECTRIC VEHICLES USING HYBRID AI MODEL**

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Electric Vehicles (EVs) are pivotal in reducing green- house gas emissions and advancing sustainable transportation. The battery system, as the most critical and expensive component in EVs, significantly influences vehicle performance, range, and safety. Accurate prediction of battery ageing is essential, as it forms the basis for estimating both the Remaining Useful Life (RUL) and the vehicle's driving range, which are key outcomes for effective battery management and operational safety. This study proposes a hybrid Artificial Intelligence (AI) model based on Long Short-Term Memory (LSTM) networks as a data-driven approach to enhance the accuracy and reliability of battery RUL and Vehicle Range prediction.

In contrast to traditional model-based methods which often struggle with the complex, non-linear nature of battery degradation, we explored hybrid modeling approaches that leverage temporal dependencies in battery health data for improved prediction performance using the Nissan Leaf 2018 dataset. Our findings indicate that LSTM-based models are well-suited for battery health prediction tasks. By fine-tuning the model architecture, our method aims to deliver interpretable and reliable estimates that can contribute to more effective Battery Management Systems (BMS) in electric vehicles. We evaluated our model using standard performance metrics including Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), and  $R^2$  Score to assess prediction accuracy and robustness. The proposed hybrid model was employed to predict State of Health (SOH) and State of Charge (SOC), which are essential dependent features for estimating RUL and vehicle range. The model achieved RMSE values of 0.0693 and 0.1397, and MAE values of 0.0456 and 0.0566 for SOH and SOC, respectively, indicating high prediction accuracy. Our approach, which integrates multiple battery health parameters and leverages

deep learning techniques, demonstrated improved results in predicting battery ageing. These advancements contribute to more reliable range estimations, helping to reduce range anxiety and promote wider EV adoption.

#### **348. AN IMPROVED DOUBLE FUZZY BASED PHYSICAL UNCLONABLE FUNCTION FOR SECURED KEY ENCRYPTION AND AUTHENTICATION IN IOT APPLICATIONS: DFPUS\_IOT**

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In today's fast-paced technological world, time is a crucial factor in everyone's busy life. The growing need for smart and sensor-based appliances that operate autonomously presents a viable solution to managing time effectively. The Internet of Things (IoT) is a vast network that connects physical objects, including vehicles, devices, and buildings, by embedding them with hardware and software to enable seamless communication. This interconnected system facilitates fast data collection and exchange through Wireless Sensor Networks (WSN), which act as a virtual layer for IoT. However, secure communication and data exchange in this network pose significant challenges, requiring robust authentication protocols and encryption mechanisms. Continuous environmental monitoring is essential for accurate data acquisition, but it becomes complex and challenging, especially in critical situations. To address these issues, ensuring secure and uninterrupted data transfer among IoT devices in WSN is essential. This paper presents "DFPUS\_IOT" a dynamic, double-fuzzy-based Physically Unclonable Function (PUF) key generation mechanism designed for authentication and secure encryption in IoT-driven environmental monitoring. This approach enhances security by leveraging the double-fuzzy concept. Alongside secure key distribution, the study also evaluates various performance parameters, including elliptic curve (EC) additions, multiplications, pairing operations, hash-to-point functions, security performance, and energy consumption.

#### **349. ENHANCING SPEECH EMOTION RECOGNITION USING LONG SHORT TERM MEMORY NETWORK**

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Speech emotion recognition (SER) plays a crucial role in enhancing human-computer interaction by enabling machines to understand and respond to human emotions. In our project, we explore the limitations of the previously employed method that combines Convolutional Neural Networks (CNN) with Long Short-Term Memory (LSTM) networks for SER tasks. While this fusion approach has shown promise, it is hindered by the inherent limitation of LSTM cells, which retain the output of the CNN for a specific time instant. This characteristic is inadequate for capturing the complex temporal dependencies present in time-series data, leading to suboptimal performance in recognizing emotions.

To address this drawback, we propose a novel method that leverages Three-layer stacked LSTM networks, which are designed to capture temporal features more effectively by processing the input data. This approach allows the model to utilize contextual information from time steps, enhancing its ability to discern emotional nuances in speech. We utilize the Toronto Emotional Speech Set (TESS) datasets, which provides a rich source of emotional speech data for training and evaluation. Additionally, we incorporate Mel-frequency cepstral coefficients (MFCCs) as supplementary features to enrich the representation of spoken words. MFCCs are known for their effectiveness in capturing the spectral characteristics of audio signals, which are vital for emotion recognition. Our experimental results may demonstrate that the proposed Multiple layer LSTM-based method significantly outperforms the traditional CNN-LSTM fusion approach, achieving higher accuracy in classifying emotional states. This advancement not only contributes to the field of speech emotion recognition but also paves the way for more sophisticated emotion-aware systems in various applications.

### **350. SMART CURVE CRASH AVOIDANCE USING 2CAP IN VANETS**

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Vehicular Ad-Hoc Networks (VANETs) have emerged as a promising solution for enhancing road safety by enabling communication among vehicles and infrastructure. One major challenge in VANETs is curve crashes, which often result from loss of control due to insufficient awareness of curve conditions or abrupt speed changes. This paper introduces a Novel Curve Crash Avoidance Protocol (CCAP) designed to reduce such incidents. The protocol integrates real-time data from vehicles and roadside infrastructure to offer early warnings and driving recommendations near curves. By leveraging vehicle-to-vehicle (V2V) and vehicle-to-infrastructure(V2I) communication, it enables vehicles to adjust speeds and trajectories dynamically based on environmental factors. CCAP employs a data-driven model that uses vehicle dynamics, road geometry, and weather conditions to predict crash risks. It analyzes inputs like speed, acceleration, and location to provide real-time feedback, including braking points, speed control, and lane adjustments. Using machine learning, it improves its predictions over time. This adaptive and cooperative system enhances safety, ensuring effective performance under varying road and traffic conditions.

### **351. TRAVEL EASE : PERSONALISED TRAVEL PLANNING SYSTEM USING AI**

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Tourism planning is an essential part of the travel industry because it provides travelers a methodical and seamless approach to discovering new places. A tourism planner is a sophisticated instrument that aids individuals and organizations. efficiently plan trips by offering individualized recommendations for options for dining, attractions, lodging, and other activities. The system optimizes the user's itinerary by combining real-time information like weather forecasts, availability checks, travel information advisories, and special offers. It facilitates travel by inputting specific preferences like budget, interests, and travel dates and uses algorithms to recommend the best places to go and things to do based on those elements. It makes it simple for businesses to manage bookings, promotions, and feedback from

customers, simplifying travel agency operations and providers of services. Additionally, the document emphasizes the increasing significance of digital tools in the travel industry, focusing on the ways in which tourism planners are reshaping the way people engage with travel, making it more accessible, enjoyable, and efficient. With its ability to cater to both individual travelers and organizations, the tourism planner is poised to revolutionize the tourism experience, ensuring a journey that is individualized and free of stress. A trip's planning is a complicated process that requires balancing personal preferences, budgetary constraints, and time constraints. While existing solutions such as online travel agencies, itinerary generators, and recommendation platforms offer assistance, they often fall short in delivering truly personalized experiences.

### **352. PADDY LEAF DISEASE CLASSIFICATION USING EFFICIENT NET B4 WITH COMPOUND SCALING AND SWITCH ACTIVATION: A DEEP LEARNING APPROACH**

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Paddy leaf diseases pose a significant threat to rice production worldwide, leading to decreased yield and quality. Timely and accurate disease detection is essential for effective crop management. In this study, we propose a novel approach for paddy leaf disease classification using EfficientNet-B4 with compound scaling and switch activation in deep learning. EfficientNet-B4, a state-of-the-art convolutional neural network, is enhanced using compound scaling, which optimizes both the depth, width, and resolution of the model, ensuring better performance with fewer parameters. Additionally, switch activation is employed to enhance the model's ability to adaptively select optimal activation functions during training, improving the model's robustness and accuracy in classifying various paddy leaf diseases. The proposed method is trained and evaluated on a large-scale paddy leaf disease dataset, showing significant improvements in classification accuracy and computational efficiency compared to traditional deep learning models. The results indicate that this approach can be effectively used for automated disease detection in paddy fields, contributing to precision agriculture and sustainable farming practices.

### **353. DEVELOPMENT OF INFANT SLEEPING BAG WITH INTEGRATED POLYIMIDE LIG HEATER PAD AND DIAPER WETNESS DETECTION USING LIG-INTERDIGITATED ELECTRODES**

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Hypothermia is a critical medical condition in which the body loses heat faster than it can generate it, which leads to a rapid body temperature. Neonates and infants are especially vulnerable to hypothermia, due to their high surface area to body weight ratio and underdeveloped thermoregulatory mechanisms, making them prone to complications such as respiratory distress, metabolic disorders and increased infection risk. To address these challenges, the present work presents development of a smart infant sleeping bag that integrates both thermal regulation and hygiene monitoring. The system incorporates a laser induced graphene (LIG) based heater pad that activates automatically when ambient temperature falls below a defined threshold, to maintain the infant's body temperature within the optimal range of

36.5°C to 37.5°C. The heating mechanism ensures uniform thermal distribution while maintaining energy efficiency and safety for prolonged use. Additionally, a wetness detection system utilizing LIG interdigitated electrodes is embedded for early detection of diaper saturation, helping to identify when the diaper is fully filled. This allows caregivers to intervene promptly before prolonged exposure to moisture leads to discomfort, skin irritation, or diaper dermatitis. Real-time alerts are delivered to caregivers through a mobile application built on the Blynk IoT platform, enabling timely response and enhancing infant comfort and hygiene. The proposed smart system is compact, non-invasive, and well-suited for both home and clinical neonatal care settings.

### **354. EMPOWERING AGRICULTURE PRODUCTS WITH QR CODE VERIFICATION AND SENTIMENT ANALYSIS**

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The manufacturing and marketing of counterfeit or duplicate products pose significant financial, health, and safety threats to end users. Additionally, they negatively impact the economic growth of original manufacturers and businesses through revenue losses. Farmers also face numerous challenges, including the inability to sell their agricultural products (such as crops, fruits, flowers, and vegetables) at fair market prices due to a lack of knowledge. As a result, they often sell large quantities of their produce to brokers at significantly lower prices. According to Goldman Sachs, brokers have become dominant buyers in the agricultural market, controlling farmer earnings and absorbing most of the profits. Furthermore, customers increasingly rely on online reviews for product information. However, fake reviews mislead consumers, distorting perceptions of product quality. Counterfeit goods have become a global issue, deceiving consumers into purchasing unauthentic products with no reliable means to verify authenticity. The current supply chain also contains a significant number of counterfeit goods. To address these challenges, we propose a QR code-based farmer and broker details upload system integrated with a sentiment analysis algorithm to detect fake reviews and counterfeit products. Additionally, this system leverages blockchain technology to securely store farmer-uploaded product details, ensuring transparency, traceability, and authenticity in agricultural transactions. Blockchain provides an immutable and decentralized ledger that prevents tampering and fraud, allowing customers and businesses to verify product authenticity before purchasing. This approach not only empowers farmers by giving them direct access to fair-market pricing but also safeguards consumers from fraudulent goods and misleading reviews.

### **355. A SURVEY ON BUILD AN APPLICATION TO ENHANCE AND RESTORE OLD OR DAMAGED PHOTOGRAPHS**

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Building an application forms the basis of this research which uses modern image processing methods together with machine learning technology to restore aged photos that show damage. Through its modern system the application restores aging photos while improving their visual quality together with



color accuracy and structural features. The system implements deep learning models including convolutional neural networks (CNNs) and generative adversarial networks (GANs) which enable users to perform automated scratch and blemish removal and noise reduction and contrast adjustment along with black and white image colorization and resolution enhancement. Through its easy-to-use interface users can submit photographs then the software enables real-time laboratory testing of restoration tools prior to image completion. Visual Appeal and customization features are built into this tool through manual editing options for advanced user control. This application helps protect documentary and personal memories by improving damaged photos into high-quality visually compelling images targeting professional influencers along with photography experts and cultural curators

### **356. DESIGN AND SIMULATION OF EXHAUST MUFFLER FOR KTM 390 SINGLE CYLINDER ENGINE**

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This project work illustrates the difference in noise reduction and performance values between a dual outlet muffler and single outlet muffler. A muffler is a really important component of the vehicle as it is designed to dampen the loud sounds produced by the engine's exhaust gases as they exit the vehicle, while reducing the backpressure of the gases as well. In the current scenario, the need of a good muffler is very necessary as there is a significant surge in the number of people buying a car, hence we need to make sure of better combustion and reduced noise levels in a vehicle. The influence of different model geometries and how they affect the gas flow like muffler geometry, number of hole perforations, and their size are important from the noise perspective from the engines. This study focuses on the effect on the backpressure and the insertion loss when the geometries of the mufflers are changed. Different variations are implemented like 2 separate diameters of baffle holes that are 20mm or 25mm, number of perforations per row being 10 or 13 and diameter of hole perforation being 3mm on inlet pipe and 5mm on outlet pipe or 4mm on inlet pipe and 6mm on outlet pipe. A muffler is designed using SOLIDWORKS software and performance parameters are analyzed using ANSYS FLUENT. CFD and Harmonic Acoustics study are performed on the muffler models, recording the inlet and outlet pressure, recording the pressure and the transmission loss in the muffler and comparing it with the other variations.

### **357. DATA BREACH MONITORING SYSTEM**

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Data breaches pose a critical threat to the confidentiality, integrity, and availability of sensitive information across digital infrastructures. As cyberattacks become increasingly sophisticated, the need for proactive and real-time monitoring systems has become imperative. This research presents the design and implementation of a comprehensive Data Breach Monitoring System aimed at detecting, logging, and alerting users about potential data breaches. The system leverages API integrations from reputable breach-reporting platforms such as Have I Been Pwned, Mozilla Monitor, and Avast Breach Guard to continuously track compromised credentials and exposed personal data. Built using a Flask-  
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based backend and a responsive HTML/CSS/JavaScript frontend, the system ensures real-time analysis, secure authentication, and an intuitive user interface. In addition, the dashboard provides centralized visibility into breach incidents, supporting both individual users and organizations in timely mitigation. The proposed solution not only enhances breach awareness but also serves as a foundational tool for future integrations of machine learning models and NLP techniques for insider threat detection. This system demonstrates a scalable, efficient, and user-centric approach to cybersecurity monitoring in an increasingly data-driven world.

### **358. ADVANCED BITCOIN PREDICTION USING SOCIAL MEDIA INFLUENCER: REAL TIME APPLICATION USING ISTM, FLASK AND BOOSTING ALGORITHM.**

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Bitcoin is an online currency that exists as a digital asset as well as an instrument of payment. It can be used to make anonymous payments between users, which has seen it become the preferred method of illicit online behavior. In the recent past, the increase in value of Bitcoin has received enormous attention from both the media and the public at large. The purpose of this research is to examine the foreseen patterns of the price of Bitcoin. Machine learning algorithms are bound to offer some insights that may enable us to comprehend the future of cryptocurrency. Apart from fundamental market conditions, social media personalities have a pivotal role in forming investor attitudes and influencing price swings. This research integrates social media data in real-time as a central aspect of Bitcoin price forecasting, utilizing machine learning models like the Integrated Seasonal Time series Models (ISTM) network and boosting algorithms to increase the accuracy of prediction. By observing social media engagement metrics, sentiment analysis, and influencer-led discussions, the model reflects the dynamic correlation between public sentiment and market activity. The suggested methodology combines Flask for real-time deployment, allowing for constant data collection and processing. The method not only enhances Bitcoin price prediction but also identifies the increasing influence of social media influencers on cryptocurrency markets, offering useful information for traders and investors

### **359. RED TIDE ALGAL BLOOM IMAGE CLASSIFICATION USING CONVOLUTIONAL NEURAL NETWORKS**

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Harmful algal blooms, specifically red tide events caused by certain species of algae, represent a major threat to marine ecosystems, aquatic biodiversity, and coastal economies. These blooms often result in oxygen depletion, marine life mortality, and health hazards for humans. This includes skin irritation, respiratory issues with additional triggers for those with conditions like asthma. This project aims to address this challenge through a comprehensive system that detects and classifies the various types of red tide algal blooms by species using a combination of image classification and environmental data

analysis. The system employs convolutional neural networks in order to do so. In addition to image-based detection, the system integrates water quality parameters, including temperature, pH, and nutrient levels, to provide an assessment of the environmental conditions conducive to algal growth. By correlating these factors with the growth stages identified through image analysis, the system can predict the proximity of the algae to bloom conditions. Furthermore, the project emphasizes actionable prevention strategies. Based on the predictions, recommendations for mitigating algal growth are generated.

### **360. A DIGITAL RECOMMENDATION SYSTEM FOR PERSONALIZED LEARNING TO ENHANCE ONLINE EDUCATION**

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Personalized learning has emerged as a critical component in online education, contributing to improved learning outcomes and student engagement. This project's main goal is to create a personalized learning recommendation system by combining student data collection from the Neurosky EEG Biosensor, AI, and the Flask Web Framework. Using behavioral and physiological data, the system seeks to determine each student's level of knowledge, then uses Fluxy AI to modify the learning materials accordingly. Additionally, this system offers content creation, AI-powered virtual proctoring, and real-time progress tracking, all of which guarantee an engaging and personalized learning environment. This platform will use cutting-edge algorithms like Hybrid Neural Collaborative Filtering (HNCf) to offer precise and dynamic course recommendations based on the strengths and weaknesses of each learner. Personalized learning has emerged as a critical component in online education, contributing to improved learning outcomes and student engagement. This project's main goal is to create a personalized learning recommendation system by combining student data collection from the Neurosky EEG Biosensor, AI, and the Flask Web Framework. Using behavioral and physiological data, the system seeks to determine each student's level of knowledge, then uses Fluxy AI to modify the learning materials accordingly. Additionally, this system offers content creation, AI-powered virtual proctoring, and real-time progress tracking, all of which guarantee an engaging and personalized learning environment. This platform will use cutting-edge algorithms like Hybrid Neural Collaborative Filtering (HNCf) to offer precise and dynamic course recommendations based on the strengths and weaknesses of each learner.

To make sure that learning is tailored for each user, the system also makes use of Reinforcement Learning (RL) to forecast and suggest content based on continuous interactions. The platform prioritizes data privacy and ensures that student data is handled securely while offering useful feedback on learning progress. By bridging the gap between intelligent, adaptive learning systems and traditional online education, this project will improve accessibility, efficiency, and student-specific customization of education.

### **361. AUTOMATED AADHAAR AND SMART CARD VERIFICATION SYSTEM USING OCR, QR CODE SCANNING AND FACE RECOGNITION FOR GOVERNMENT LOAN WAIVERS**

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In the evolving digital ecosystem, identity verification has become a cornerstone of secure access to government services, financial systems, and public welfare schemes. In India, Aadhaar serves as the foundational identity document for millions; however, increasing incidents of fraud, misuse, and forgery have highlighted vulnerabilities in existing verification processes. This paper presents a comprehensive, automated Aadhaar-based identity authentication system that integrates facial recognition, Optical Character Recognition (OCR), QR code validation, and Aadhaar-smart card linkage. The system employs AI, computer vision, and cryptographic techniques to perform multi-step verification, including template validation, real-time face matching, data cross-verification with secure databases, and QR decoding for data consistency. Offline functionality with encrypted cloud sync ensures usability in rural or low-connectivity regions. The platform is designed for scalability and integration with government and private sector portals, offering a robust solution to minimize human intervention, reduce identity fraud, and protect citizen data. By leveraging open-source technologies such as EasyOCR, Pyzbar, and FaceNet, the system remains adaptable and cost-effective for large-scale deployment. This research addresses key challenges in digital identity management and proposes a scalable, secure, and transparent verification model suited for diverse operational environments

### **362. AI-POWERED AMBULANCE TRACKING, EMERGENCY RESPONSE, AND ORGAN-BLOOD MANAGEMENT SYSTEM**

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3 Ms.K.S.Akshayanivasini ,  
4Mr.T. Aravinth Balaji,  
5Ms.V .Arunadevi,  
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The AI-Powered Ambulance Tracking, Emergency Response, and Organ-Blood Availability System is an innovative solution designed to optimize emergency medical services by ensuring faster ambulance dispatch, intelligent hospital coordination, and real-time resource tracking. Emergency response inefficiencies, including ambulance delays, traffic congestion, and lack of centralized organ-blood availability, often lead to life-threatening situations due to delayed medical interventions. Many patients struggle to receive timely emergency care, particularly in areas with high traffic congestion or limited healthcare facilities. Leveraging advanced artificial intelligence, this system integrates real-time GPS tracking, AI-driven route optimization, and predictive analytics to ensure that ambulances reach patients in the shortest possible time. By analyzing live traffic data and dynamically adjusting routes, the system minimizes delays and enhances emergency response efficiency. Beyond ambulance tracking, the system extends to AI-driven organ and blood bank management, offering an intelligent platform for donor-recipient matching and hospital resource allocation. Through deep learning algorithms, the system predicts blood shortages, identifies compatible organ donors, and automates hospital coordination, reducing waiting times for life-saving transplants and critical blood transfusions. This AI-driven approach not only enhances emergency response capabilities but also revolutionizes healthcare logistics by ensuring seamless communication between ambulances, hospitals, and medical resource providers. By integrating AI, machine learning, and real-time data processing, this system significantly improves emergency response times, optimizes medical resource utilization, and enhances patient survival rates in critical conditions.

### **363. DEVELOPMENT OF SOLAR STILL WITH FRESNEL LENS AND CONDENSOR**

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Prof.(Dr).U.S.Chavan  
Karan Nikam  
Prof.(Dr).A.U.Rajurkar  
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Water scarcity is a major challenge in India, driven by overpopulation, urbanization, and climate change. Traditional water purification techniques are energy and resource-intensive, which restricts their application in rural settings. This project improves solar distillation—a low-cost and sustainable technique—by combining a Fresnel lens and a condenser into one slope solar still, enhancing its efficiency and water yield. Experimental yields from Pune, India, show higher water yield and efficiency with respect to conventional designs. Quality testing ensured the distilled water is of safety standards. The technique presents a scalable, sustainable method for clean water in water-scarce areas that contributes to global water security efforts.

### **364. ADAPTIVE DIGITAL TWIN OF AN INDUCTION MOTOR USING MACHINE LEARNING AND MIXED REALITY**

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This project develops an intelligent digital twin system for real-time monitoring and adaptive control of an induction motor. Utilizing Arduino Uno, integrated sensors (voltage, current, vibration, temperature, and speed), machine learning algorithms, and a mixed reality interface in Unity, the system enables dynamic visualization and predictive maintenance. Sensor data is continuously transmitted to a Unity-based 3D digital twin, which offers immersive, real-time feedback on motor performance. A machine learning model, trained on historical data, drives an adaptive control mechanism that incrementally adjusts motor speed when unsafe conditions are detected, optimizing system stability. The mixed reality environment enhances user interaction, providing situational awareness through interactive 3D visualization and live data overlays. This project showcases the convergence of IoT, and mixed reality to improve industrial motor efficiency, reliability, and predictive maintenance capabilities.

### **365. HELPMATE-A WOMEN SAFETY DEVICE USING IOT AND MACHINE LEARNING**

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These days, society threatens women on a number of levels. Women's safety is therefore a significant issue that requires effective solutions. Although some innovations have been made in this area, they are not very effective because they require human interaction to function. It is evident from past experiences that a victim might not have the opportunity or time to press any buttons or turn on any apps. Here, we attempt to put in place a gadget that can partially solve these problems. This wearable gadget can tell the difference between a woman's normal circumstances and a dangerous one. The gadget will automatically call and message the contacts if it detects a dangerous situation.

### **366. ANALYSIS AND COMPARISON OF VARIOUS POWER CONVERTER**

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This project deals with Quadratic Boost Converter both in open loop and closed loop system. The need of DC-DC switching converter for power supplies with high voltage gains has increased in the recent years. Due to new application in areas as renewable Energy system, transportation, industrial, medical and others. A quadratic boost converter is a useful topology to obtain a step-up output voltage. However, a major drawback is the presence of a higher voltage Stress over the active and passive switches. Project combined with an output filter offer a high – voltage gain converter with non-pulsating input and output currents. The expression for the capacitor voltages and inductor currents are given as well as the corresponding ripples that allows the proper design of the converter. The bilinear switched, nonlinear averaged Models are derived such that the dynamical behavior of the converter is analyzed and used to design a control strategy simulation results are obtained by using MATLAB / Simulink.

### **367. INTEGRATING NETWORK ANALYSIS AND ML FOR SUPERIOR FINANCIAL RISK PREDICTION**

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2nd Pooranam N  
3rd Monish Kumar A  
4th Navadeesh S  
5th Niranjane B  
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Financial distress prediction has become a key focus in the financial industry, as early identification of distressed firms can lead to better risk management and more informed decision-making. This study introduces a novel Hybrid Network Analysis and Machine Learning Model aimed at improving the accuracy of financial distress predictions. The proposed model integrates network analysis to examine the intricate relationships between firms in a financial ecosystem, leveraging graph theory to highlight interdependencies and potential contagion risks that are often overlooked in traditional models. By  
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understanding these network dynamics, the model identifies firms that might be vulnerable to financial distress based on their connections within the broader financial system. To enhance the predictive power, the model incorporates machine learning algorithms, such as Random Forest and Support Vector Machines (SVM), to learn patterns from financial data. These algorithms are trained on a combination of historical financial indicators, market sentiment data, and other relevant features. The synergy between network analysis and machine learning enables the model to capture both the structural relationships between firms and the temporal trends in financial performance, providing a more comprehensive view of financial health. Additionally, the machine learning component allows for automated learning and continuous adaptation to new data, making the model scalable and adaptable to various financial environments. The proposed hybrid approach outperforms traditional financial distress prediction models by combining the strengths of network analysis and machine learning. Experiments conducted on real-world financial datasets demonstrate that the model offers superior accuracy and robustness in identifying distressed firms compared to conventional techniques. By integrating both structural (network-based) and dynamic (financial) information, the model presents a more holistic view of financial risks and can serve as an effective tool for early detection and proactive intervention in managing financial crises.

### **368. LEVERAGING TRANSFER LEARNING TO ANALYSE SOFTWARE DEVELOPERS OPINIONS FOR ENHANCED PROJECT INSIGHTS**

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In order to enhance sentiment analysis of social media content, this study investigates the use of several sophisticated machine learning and deep learning algorithms, such as Random Forest, Multi-Layer Perceptron (MLP), Convolutional Neural Networks (CNN-1D), Bidirectional Encoder Representations from Transformers (BERT), and Generative Pretrained Transformers (GPT). The goal of the research is to improve the depth and accuracy of sentiment classification in software development projects by utilizing the advantages of these various models. Because of its capacity to manage big datasets and reveal intricate relationships among text data, Random Forest is used.

The more complex aspects and contextual subtleties of the textual material, however, are captured by neural network-based models like as MLP, CNN-1D, and BERT. By producing richer representations of language, the state-of-the-art language model GPT helps to improve sentiment analysis. The benefits of both contemporary deep learning techniques and conventional ensemble learning are combined to create a potent ensemble system. A more thorough and precise understanding of developer viewpoints is made possible by this hybrid method, which offers insightful information that may guide project management techniques and software development procedures. In the end, this study shows how sophisticated AI methods can enhance the caliber and efficacy of sentiment analysis for software development decision-making.

### **369. CLOUD RESOURCE MONITOR FOR MISCONFIGURATION DETECTION**

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Cloud computing has revolutionized the way organizations manage their digital infrastructure, but it also introduces new security risks due to asset misconfigurations. This paper presents Cloud Resource Monitor, an automated framework designed for real-time detection of misconfigured cloud assets. The system continuously monitors cloud environments, scans for vulnerabilities, and provides instant alerts through webhook-based notifications. By integrating asset enumeration, risk analysis, and automated reporting, the framework minimizes manual effort and reduces the chances of human error. Experimental results demonstrate that Cloud Resource Monitor enhances security posture by enabling early detection of risks, leading to faster mitigation and improved cloud governance.

### **370. TOWARDS SAFER SOCIAL MEDIA: REAL-TIME EUPHEMISM AND TOXICITY DETECTION IN ONLINE USER INTERACTIONS**

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With the rise of social media platforms, incidents of toxic language have significantly increased, contributing to a hostile online environment. It's important to identify and remove offensive language from social media, online games, forums, and workplace chat. This protects users and improves their experience. Existing models for toxicity detection face pitfalls in handling euphemisms and contextual variations, often resulting in false positives and reduced adaptability. Our proposed model addresses these challenges by integrating a pre-trained model, character-level embeddings, and an attention layer, specifically designed to detect nuanced toxic language and euphemisms more efficiently. This model demonstrates enhanced accuracy and robustness, reducing false positives and improving detection performance. Comparative analysis with existing models highlights its superior adaptability, making it a versatile tool for moderating toxic language across diverse online spaces.

### **371. CORRUGATION GEOMETRY EFFECT ON HEAT TRANSMISSION AND PIPE FLOW CHARACTERISTICS**

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Corrugated copper pipes with water as the working fluid are studied for their thermal and flow dynamics using computer models. By upsetting boundary layers, generating secondary flows, and increasing turbulence, corrugated pipes enhance heat transfer and are therefore beneficial for energy-efficient heat exchanger designs. The number of corrugated rings (NCR), pipe corrugation ratio (PCR), and corrugated ring diameter (CRD) are some of the corrugation geometries that have been studied to find the optimal balance between acceptable pressure drop and heat transfer enhancement. ANSYS Configurations differ significantly in turbulent kinetic energy (TKE), vorticity, dynamic pressure, and velocity, according to fluid-based computational fluid dynamics (CFD) simulations. Significant results



show a clear relationship between better turbulence and increased CRD, and minimal temperature change across a 500 mm pipe length. The implementation of ASTM standards ensured data dependability and comparability. This research contributes to the development of passive heat transfer, which advances sustainable energy goals and is relevant to the energy sector, particularly in power generation, heating ventilation and air conditioning (HVAC), and refrigeration. Through useful information on corrugated pipe design optimization, the results increase the efficiency of thermal systems in industrial applications.

### **372. ALGORITHMIC TRADING BOT**

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We detail, in this chapter, the design and implementation of an automated trading bot for cryptocurrency, which can detect real-time signals through email alerts, and use it to trade on the Binance exchange. This bot creates both Python automation and message retrieval using the Binance API, which can receive data through Gmail via IMAP, and will check for trading signals sent from TradingView. When the bot identifies a valid buy or sell signal from the last five minutes, it autonomously executes a market order for Bitcoin (BTC/USDT) on the Binance Testnet. The bot loops continuously with very little user input, which is favorable for timeefficient, hands-free algorithmic trading. Highlights of this project include real-time email retrieval and parsing, credential security, and executing market orders based from an arbitrary buy/sell signal. In this paper, we will discuss how to combine open-source technologies to realize low-latency trading strategies, which can make the challenges and advantages of automated car trading 'real' for retail traders interested in automating their basic trading logic.

### **373 DETECTING SPAM AND FAKE USERS ON SOCIAL MEDIA PLAT FORM USING MACHINE LEARNING**

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The proliferation of spam content and phony user accounts brought about by the growth of social media platforms, especially Twitter, has seriously hampered platformsecurityand user experience. The goal of this project is to use machine learning and natural language processing (NLP) to create a reliable system for Twitter spam detection and fake user identification. Accurately classifying tweets as spam or non-spam and identifying accounts that display traits of phony or bot users are the main goals. Data is first gathered from a publicly accessible Twitter Spam Dataset, and the pandas library is then used to pre-process the data. Text is cleaned and prepared for analysisusingavarietyofnaturallanguage processing (NLP) techniques, including stemming, tokenization, and stop word removal. The data is also prepared for machine learning models by handling missing values and applying label encoding. For better performance, the systemuses hybrid approaches in addition to twoclassification algorithms, Random Forest and Gradient Boosting Classifier. In order to transform text data into a format that is appropriate for model training, feature extraction is carried out using vectorization techniques such as Count

Vectorization and BERT. The end product is a classification result that determines whether a user is fraudulent and whether a tweet is spam. To assess the models' efficacy, the system also offers performance metrics like accuracy, precision, recall, and F1-score. By automatically blocking detected fraudulent users, the suggested system greatly improves security and makes social media safer and more effective. Flask is used to implement the system's user-friendly GUI, making it accessible to non-technical users.

### **374. REMLINK: A UNIFIED PLATFORM FOR AUTOMATED CLASSIFICATION AND COLLABORATIVE SHARING OF WEB RESOURCES**

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The rapid proliferation of online content across platforms such as social media, blogs, and streaming services has made efficient link management a critical challenge for users. Existing tools often lack intuitive organization, collaborative features, or intelligent automation, leading to fragmented and time-consuming workflows. This paper proposes a novel application that addresses these gaps by integrating artificial intelligence (AI) with user-centric design principles. The platform enables users to save, categorize, and share web links into customizable public or private collections, leveraging machine learning to auto-classify content and suggest relevant categories. Key innovations include a dynamic tagging system, a privacy-focused commenting interface for secure collaboration, and a multi-criteria search engine. By combining automated suggestions with manual customization, the solution empowers users to reduce cognitive load while maintaining control over their data. Technical implementation details, including a microservices backend and transformer-based NLP models, are discussed. The proposed system demonstrates potential applications in education, research, and enterprise knowledge management, offering a scalable and secure alternative to conventional bookmarking tools.

### **375. ENHANCING TEXTILE MANUFACTURING EFFICIENCY THROUGH GRADIENT BOOSTING MACHINES: A DATA DRIVEN APPROACH**

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In today's competitive textile manufacturing landscape, enhancing efficiency and product quality is vital for ensuring profitability and long-term sustainability. This study introduces a data-driven methodology aimed at optimizing textile production processes through the use of Gradient Boosting Machines (GBMs), a robust machine learning technique. By analyzing data collected from different stages of the textile manufacturing process, we identify critical factors that affect both efficiency and quality. Our model, built using historical production data, predicts and mitigates inefficiencies such as machine downtime, defective outputs, and variability in product quality. The findings reveal that Gradient Boosting outperforms conventional statistical approaches, offering more precise predictions and practical insights. Key performance indicators such as production throughput, waste reduction, and quality consistency are improved through the implementation of this model. This study highlights the transformative potential of machine learning in modernizing traditional manufacturing processes,

presenting a scalable solution for textile manufacturers to boost operational efficiency and drive sustainable growth

### **376. PREDICTING CYBERBULLYING ON SOCIAL MEDIA USING MACHINE LEARNING ALGORITHMS**

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The rise of social media has revolutionized global communication, enabling individuals to connect, share experiences, and express opinions across geographical and cultural boundaries. However, this digital expansion has also contributed to the widespread issue of cyberbullying, which presents serious psychological, emotional, and social risks. Cyberbullying involves the use of digital platforms to harass, intimidate, or demean individuals through offensive language, threats, or harmful content. Given its severe consequences, such as anxiety, depression, and even suicidal tendencies among victims, detecting and preventing cyberbullying in real time has become a critical priority for ensuring a safer online environment. This study explores the application of machine learning algorithms to predict and detect instances of cyberbullying by analyzing user-generated content on various social media platforms. Unlike traditional rule-based moderation techniques, which often fail to capture the evolving nature of online abuse, machine learning provides a more dynamic and efficient approach to identifying harmful content. A range of classification techniques, including Natural Language Processing (NLP), sentiment analysis, and contextual embedding models, are employed to recognize abusive language, harmful intent, and subtle contextual cues that might indicate cyberbullying. NLP techniques allow the system to process and interpret textual data, enabling it to distinguish between benign conversations and potentially harmful interactions.

### **377. A ROBUST FRAMEWORK FOR LATTICE-BASED DATA SHARING IN CLOUD ENVIROINMENTS**

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With the increasing reliance on cloud computing for outsourced data storage and sharing, ensuring both security and efficiency in encrypted data sharing has become a critical challenge. Attribute-Based Proxy Re-Encryption (ABPRE) has emerged as a promising solution, allowing a cloud server to transform a ciphertext intended for an original recipient into one decryptable by a designated shared user based on their attributes. However, existing ABPRE schemes lack mechanisms to guarantee verifiability and fairness, making them vulnerable to dishonest cloud servers returning incorrect re-encrypted ciphertexts to save computational resources, or malicious shared users falsely accusing honest servers of misconduct. To address these issues, A novel Verifiable and Fair lattice Attribute-Based Proxy Re-Encryption (VF-ABPRE) scheme based on lattice-based cryptography is implemented. The proposed scheme ensures verifiability by enabling shared users to efficiently verify the correctness of the re-encrypted ciphertext before decryption. Additionally, it incorporates a fairness mechanism that prevents false accusations by providing cryptographic proofs of honest re-encryption operations. By leveraging

lattice-based cryptographic constructions, this scheme achieves strong security guarantees against quantum adversaries while maintaining computational efficiency. The core of this VF-ABPRE scheme is built upon lattice-based homomorphic encryption techniques and trapdoor functions, which provide robustness against known cryptographic attacks. The re-encryption process is designed to be verifiable through a publicly verifiable proof, ensuring that any recipient can independently check the integrity of the transformed ciphertext. Furthermore, the fairness mechanism employs zero-knowledge proofs to allow the cloud server to demonstrate its correct execution of re-encryption without revealing sensitive information about the original data.

### **378. DIFFERENT METHODS OF AUTHENTICATION - A COMPARATIVE STUDY**

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The rise of cyber threats has intensified the need for more secure authentication methods. Traditional password-based systems are often vulnerable to hacking, phishing, and other attacks making them insufficient for safeguarding sensitive information. This paper presents a comparative study of various hardware-based authentication techniques, including biometric scans and hardware tokens. The hardware-based systems are typically tamper-resistant, meaning that even if an attacker gains access to the device, it's difficult to extract the stored credentials or keys and the authentication data is stored locally on the device, it doesn't need to be transmitted across networks (which reduces exposure to man-in-the-middle attacks and interception). This paper also analyses and compares the performance of these methods in terms of security, user convenience, cost, and scalability, while considering their susceptibility to common vulnerabilities like spoofing and unauthorized access. Additionally, this paper discusses the trade-offs between different systems and explores potential areas for improvement. The findings aim to guide organizations in selecting the most suitable authentication solution based on specific needs and operational environments.

### **379. ENHANCED NETWORK TRAFFIC ANALYSIS USING SCAPY AND PYTHON: A LIGHTWEIGHT APPROACH**

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The project, Enhanced Network Traffic Analysis Using Scapy and Python, provides a real-time packet-sniffing and anomaly detection application using Python, Scapy, and Npcap. It provides lightweight, protocol-specific traffic analysis and incorporates machine learning algorithms such as Random Forest and SVM for anomaly detection in the form of SYN floods, port scanning, and DDoS attacks. The system records network packets, derives significant features such as IP addresses, ports, packet size, and timestamps, and classifies them for security and forensic analysis. Scalable and automated, the tool captures traffic patterns, provides protocol-based filtering, and saves captured traffic for forensic examination through tools like Wireshark. Experimental results verify high detection accuracy (up to 97%), efficient low latency, and resource usage. This project fills the gap between conventional packet sniffers and smart automated detection systems, placing itself as a real-time ethical cybersecurity tool suitable for educational, enterprise, or legal purposes.

### **380. ADAPTIVE ATTENTION MECHANISM FOR IMAGE COPY- MOVE FORGERY DETECTION**

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In recent years, the accessibility of digital image manipulation tools had led to an increase in image forgeries, which pose significant challenges in verifying image authenticity. Image forgery, particularly copy-move attacks, is widely used to manipulate images for misleading purposes, such as fake news, identity fraud, and misinformation. Traditional detection methods struggle with high computational costs and reduced accuracy in complex forgeries. This paper presents a robust deep learning-based system for detecting image morphing, particularly focusing on copy-move forgery. The proposed system leverages convolutional neural networks (CNNs) and double image compression analysis to accurately identify manipulated regions. Our method demonstrates superior accuracy and speed compared to traditional techniques, making it a viable solution for forensic and security applications. This approach helps law enforcement agencies, journalists and researchers ensure the authenticity of digital images [1].

### **381. ANESTHESIA DOSAGE PREDICTION SYSTEM FOR EFFICIENT PATIENT MANAGEMENT USING POWER BOOSTING ALGORITHM**

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This study investigated the application of machine learning algorithms to anesthesia dosage prediction, aiming to transform and enhance the delivery of anesthetics during medical operations. The primary objective was to leverage advanced predictive modeling algorithms for the analysis of extensive datasets containing patient information, medical histories, and surgical procedure details. This study aimed to address the inherent variability in patient responses to anesthesia by training machine learning algorithms to understand and adapt to the specific nuances influencing patient reactions. This personalized approach seeks to minimize the risks associated with anesthesia variability, ultimately contributing to improved patient outcomes and recovery. Real-time adaptability is a critical focus with the objective of creating systems that can continuously analyze incoming data during surgical procedures. By adjusting anesthesia predictions in real time based on evolving conditions, these systems enhance patient safety and provide dynamic decision-making support to healthcare professionals throughout the entire duration of the medical intervention. In conclusion, the integration of machine learning in anesthesia prediction has the potential to transform and optimize the administration of anesthesia. This study advances healthcare by focusing on customized forecasts, managing variability, facilitating real-time adjustments, and ensuring system compatibility. These efforts contribute to better patient outcomes, decreased medical expenses, and improved care quality in anesthesia-related medical procedures.

### **382. OPTIMIZING HONEYPOT MOBILITY: A HYBRID ML APPROACH FOR ADVANCED DDOS PROTECTION**

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Distributed Denial of Service (DDoS) attacks are persistent threats to network infrastructure, often overwhelming systems and crippling services. This paper proposes an Adaptive Roaming Strategy for honeypots using a Hybrid Machine Learning (ML) approach. Leveraging the CICDDoS2019 dataset [16], our framework combines Reinforcement Learning (Q-learning, DQN) for dynamic roaming optimization, Anomaly Detection (Autoencoders, Isolation Forests) for early attack detection, Time-Series Forecasting with LSTM for proactive response, Game-Theoretic Models for strategic honeypot deployment, and Hybrid Optimization Techniques (Genetic Algorithm and Particle Swarm Optimization) for enhanced performance. Experimental evaluation demonstrates superior accuracy, reduced resource usage, and improved adaptability compared to static defenses.

### **383. CMS VULNERABILITY SCANNER**

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Content Management Systems (CMSs) such as WordPress, Joomla, and Drupal power a significant percentage of modern websites due to their ease of use, extensibility, and large developer communities. However, their popularity makes them prime targets for attackers who exploit vulnerabilities in core code, third-party plugins, and themes. This paper proposes the design and implementation of a comprehensive CMS Vulnerability Scanner that leverages static and dynamic analysis techniques to identify known vulnerabilities and predict potential zero-day exploits. The scanner includes a CMS fingerprinting engine, plugin/theme vulnerability detection, heuristic misconfiguration analysis, and simulated attack environments. Evaluation results demonstrate enhanced detection accuracy and reduced false positives compared to existing tools. The proposed system aims to support proactive cybersecurity measures in CMS-driven web infrastructures.

### **384. AN INTELLIGENT IOT-BASED REHABILITATION SYSTEM FOR MUSCLE CRAMP THERAPY IN ARMY PERSONNEL AND ATHLETES**

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Muscle cramps are a prevalent issue among athletes and military personnel, often impairing performance and recovery. Traditional therapies lack real-time monitoring, personalization, and data-driven approaches. This paper presents an intelligent rehabilitation system that integrates sensor technology, IoT connectivity, and automated interventions for effective muscle cramp management. The system employs a NodeMCU microcontroller to interface with temperature sensors, an EMG sensor, a Peltier element, and an optional vibration motor. Real-time temperature regulation is achieved by monitoring knee temperature and activating the Peltier element upon detecting deviations. The EMG sensor enables continuous muscle activity tracking to identify cramp occurrences. Data is transmitted

to a ThingSpeak cloud platform for remote monitoring and analysis via a user-friendly web application. The system's portability and adaptability make it suitable for field use. To assess the system's performance, we conducted tests involving around 20 participants. Experimental results demonstrate its efficacy in providing immediate relief and personalized therapy. This innovation addresses critical gaps in muscle cramp management, offering a scalable solution for high-performance individuals.

### **385. CROSS ATTENTION BASED VIDEO TEMPORAL GROUNDING AND MOMENT LOCALIZATION FOR CCTV CRIME IDENTIFICATION**

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Video Temporal Grounding (VTG) focuses on localizing a temporal segment from an input video on the basis of a natural language query input and has drawn significant attention from researchers in recent years. Our study begins with the observation that most VTG approaches can be broadly classified into three categories. Further, we identify related tasks and study them concurrently, summarizing our learnings to reveal that current transformer-based video grounding methods struggle with issues such as overfitting and annotation challenges, though text query bias remains less addressed. Additionally, no existing video grounding techniques perform consistently across diverse video domains. Therefore, we propose the MMVTG project, a novel two-phased approach that utilizes Retrieval Augmented Generation (RAG) and cross-attention-based multimodal transformers for video grounding. This approach is particularly beneficial for incident identification applications, where surveillance videos are often lengthy, but only specific incidents within a particular timeframe are of interest. Our project seeks to overcome these challenges, especially in aiding surveillance authorities to accurately localize key moments in extensive footage. Our two-phase solution integrates a RAG model to refine and generate contextually relevant prompts, along with the SlowFast R50 network and CLIP transformer for frozen video, text, and multimodal encoding. We conducted an extensive benchmarking study to show that MMVTG delivers comparable results with current leaders in this field. Ultimately, the primary deliverable is a Minimum Viable Product (MVP) that fulfills these objectives.

### **386. STOCK MARKET PREDICTION USING ENSEMBLE LEARNING**

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This project is focused on building a robust predictive model for stock market forecasting, utilizing a combination of Long Short-Term Memory (LSTM) networks and Convolutional Neural Networks (CNNs). Predicting stock prices is challenging due to the volatile, unpredictable, and ever-changing nature of financial markets. LSTMs excel at detecting patterns in time-series data, making them ideal for analyzing historical stock prices. On the other hand, CNNs are highly effective in capturing spatial hierarchies and can process technical indicators and complex patterns, enhancing feature extraction. By integrating these two models, the goal is to leverage both the temporal dependencies of stock prices (captured by LSTMs) and the ability of CNNs to extract detailed features from various market factors. This hybrid approach is expected to improve forecasting accuracy and reliability, offering a more comprehensive solution for short-term stock price prediction.

### **387. FAKE PRODUCT IDENTIFICATION USING BLOCK CHAIN**

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Counterfeit items are a common problem in numerous sectors, such as electronics, fashion, pharma, and luxury. The conventional methods of verification are normally unreliable and subject to forgery. This paper suggests a blockchain-based approach for product authenticity verification by establishing a decentralized ledger wherein every product's history from the manufacturing process until the point of purchase can be traced. Using Metamask for user-to-blockchain interaction and Ganache for local development of the blockchain, the system provides transparency and security. By using unique identification tokens and smart contracts, customers are able to view an unalterable record of the history and origin of the product, allowing them to verify whether a product is real or fake. This project suggests a secure blockchain-based system to authenticate the product by utilizing a decentralized ledger that tracks each phase of a product's life cycle, from production to sale. Through the use of Metamask for secure user interfaces and Ganache for local blockchains development and testing, the system creates an environment that is both secure and transparent. Every product is allocated an individual identification token and monitored through smart contracts, allowing stakeholders and consumers to have access to an immutable, tamper-proof history of the origin, ownership, and movements of the product. This helps empower end-users to identify real products from counterfeits with confidence, eventually leading to higher levels of trust and accountability within supply chains.

### **388. SEMI AUTOMATIC PUBLIC DISTRIBUTION SHOP MANAGEMENT SYSTEM**

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This article describes a comprehensive analysis of an IoT-based semi-automatic ration shop management system intended to improve transparency, efficiency, and accountability in the Public Distribution System (PDS) of Tamil Nadu. The conventional system of ration distribution is generally prone to problems like manual mistakes, weight differences, delayed billing, and misuse of family ration cards. Such inefficiencies lead to public dissatisfaction and loss of faith in the system. To overcome these problems, this project integrates Point-of-Sale (POS) machines with electronic weighing mechanisms to ensure the accurate and transparent distribution of commodities with auto billing. After AADHAR card and fingerprint recognition, a registered family member can take rationed goods, with the system ensuring proper weighment by load cells. Real-time SMS notifications and generation of e-bills are sent to the main cardholder, offering transparency and traceability. Moreover, a web interface with in-charge and citizen-level logins provides access to shop status, availability of stock, and contact details of in-charges. The whole process is controlled and monitored through a centralized dashboard, providing fair distribution of items such as rice, wheat, and sugar. Using technologies like Arduino, Wi-Fi modules, and Firebase, this solution makes ration distribution modern and in line with the objective of Digital India.



### **389. ACADEMIC MARKSHEET DIGITIZATION USING CRNN BASED OPTICAL CHARACTER RECOGNITION**

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The Academic Marks Extraction Using CRNN and Entry Application System with Excel Integration is a deep learning-based solution designed to automate the extraction of student marks from scanned or photographed mark sheets. The system utilizes a hybrid Convolutional Recurrent Neural Network (CRNN) for optical character recognition (OCR) and advanced image processing techniques to enhance accuracy. The pipeline involves preprocessing using contrast enhancement, adaptive brightness correction, Otsu thresholding, and morphological transformations to improve text clarity. A Region of Interest (ROI) detection system segments key areas such as student details, marks tables, and remarks. The extracted text undergoes lexicon-based validation to ensure correctness before being automatically stored in an Excel database. The implementation of background removal and image alignment improves text localization, while EAST text detection and bounding box filtering refine OCR accuracy. This approach significantly reduces manual data entry effort, increases efficiency, and minimizes errors in academic record-keeping, making it highly beneficial for educational institutions, teachers, and administrative staff.

### **390. BRAIN TUMOR SEGMENTATION USING SVM AND PCA**

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Brain tumors present significant diagnostic challenges, requiring precise detection and segmentation to support effective treatment planning. Manual segmentation of brain MRI images is time-intensive and may introduce variability, emphasizing the need for automated, accurate solutions. This project proposes an approach for brain tumor segmentation that combines Support Vector Machine (SVM) classification with Principal Component Analysis (PCA) to enhance both accuracy and efficiency. PCA is used to reduce the dimensionality of high-resolution MRI data, retaining only the most relevant features for tumor detection. This streamlined data is then classified by SVM, which excels at distinguishing between tumor and non-tumor regions.

### **391. FORECASTING DISCHARGE OUTCOMES FOR CRITICALLY ILL PATIENTS USING MACHINE LEARNING**

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In the healthcare industry, predicting patient discharge outcomes is vital for optimizing hospital resource allocation and enhancing patient care. This project presents a machine learning based classification system using XGBoost to predict one of five possible discharge outcomes: Patient recovered and went home, transferred to another hospital, moved to a rehab facility, left against medical advice, deceased or serious outcome. The model is trained on structured patient data, including vital signs, laboratory results, comorbidity indices, and demographic factors. Achieving a high accuracy of 96.20%, the model serves as a reliable decision-support tool for healthcare professionals. To enhance usability, an interactive Streamlit dashboard is developed to visualize data insights and enable real-time predictions. This project showcases how data-driven approaches can improve hospital operations by streamlining discharge planning and supporting clinical decision-making.

### **392. ENERGY HARVESTING SPEED BUMP USING PIEZOELECTRIC SENSORS**

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The growing demand for renewable energy solutions has motivated the exploration of innovative methods to harness untapped energy sources. This proposal focuses on utilizing the mechanical energy generated by vehicles passing over speed bumps to produce electricity. Traditional approaches have relied on mechanical or inefficient systems, which often lacked practicality and effective energy conversion. In this proposal, we suggest the use of piezoelectric materials to capture the kinetic energy from vehicles and convert it into electrical energy. The generated power can be stored or directly utilized for operating streetlights, traffic signals, and other public utilities. This concept aims to address energy inefficiencies and reduce dependence on conventional energy sources. The proposed outcome is a sustainable energyharvesting mechanism suitable for high-traffic urban areas, contributing to energy conservation efforts while promoting ecofriendly infrastructure development. The growing demand for renewable energy has motivated the exploration of innovative methods to harness untapped sources, such as the mechanical energy from vehicles passing over speed bumps. This proposal suggests using piezoelectric materials to capture kinetic energy and convert it into electricity, which can power streetlights, traffic signals, and other public utilities. By addressing energy inefficiencies and reducing reliance on conventional sources, the proposed system offers a sustainable energyharvesting mechanism suitable for high-traffic urban areas, promoting eco-friendly infrastructure development and energy conservation

### **393. IOT-DRIVEN PRECISION INSULIN INFUSION FOR ENHANCED DIABETES MANAGEMENT IN REAL TIME**

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The more traditional approaches to insulin delivery have, and will, consume incredible amounts of clinical resources without guaranteeing optimum outcomes for patients suffering with diabetes mellitus. In the case of the presented Insulin Delivery System, a low cost portable automated insulin delivery pump is developed for self-use by diabetics who require insulin delivery at fixed and pre-specified intervals. The system facilitates subcutaneous continuous insulin infusion (CSII) therapy for diabetics. The aim of design and development of insulin delivery system focuses on cost effectiveness while providing flexibility to the patient's lifestyle, alongside the need to maintain precise and accurate insulin infusion rates based on CGMS data. The ergonomic design caters to a model of a type 1 and type 2 diabetes patient. A proposed control strategy is tested using different CGMS values that correlate to realistic meal timing and physical activity done by patients. The system is also safe. Severe embedded system which makes estimates changes the controls on the insulin delivery rate based on relative proportional control law of the patient. Insulin delivery system is an critical concept with highly reliable control the low amount of fluid delivery. The application of the infusion delivery system is to dispense a predefined volume of liquid within a specified time frame.

### **394. INTEGRATION OF AI FOR ADAPTIVE LEARNING FOR MCQ SELECTION IN PARAKH**

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The integration of AI for adaptive learning in the Parakh system aims to personalize the learning experience for each student by recommending the most appropriate multiple-choice questions (MCQs). The study begins with the collection of a comprehensive Student Profiles dataset, which consists of demographic details, academic performance, and historical assessment data. This dataset undergoes several preprocessing steps using pandas, a powerful Python library, to ensure it is ready for machine learning. Missing values are addressed through imputation, while categorical features are transformed into numerical values using label encoding. Additionally, unnecessary columns that do not contribute to the predictive modeling process are removed, ensuring that the data is both relevant and concise. Once preprocessed, the dataset is split into training and test sets, allowing for the evaluation of the model's performance. The system leverages Collaborative Filtering, a recommendation technique that identifies patterns in students' performances by comparing them to others with similar learning histories. This enables the model to suggest questions that are most likely to match the student's current level of understanding and knowledge gaps. To predict key learning outcomes, such as the student's success probability, confidence levels, and time taken to answer questions, various classification algorithms are employed. Specifically, Logistic Regression (LR) is used for binary outcomes like success or failure predictions, while Multi-Layer Perceptron (MLP) is deployed for more complex, non-linear relationships between features. These models also estimate the engagement levels of students, helping to determine when they might need hints or additional feedback. The integration of these predictive techniques allows Parakh to provide real-time, dynamic feedback, improving the adaptive learning process. By understanding students' individual progress and challenges, the system can offer a tailored experience, ensuring that students receive the appropriate difficulty level and support needed to foster continuous improvement.

### **395. SMART MEDICINAL PLANT IDENTIFICATION AND THERAPEUTIC INSIGHTS USING DEEP ENSEMBLE LEARNING AND NLP CHATBOT INTEGRATION**

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During thousands of years, traditional healing systems have relied heavily on medicinal plants for their therapeutic benefits; which many still find, in some cases even still use in their treatment. Despite morphological similarities and environmental variations, the accurate identification and classification of these plants is problematic as knowledge of experts is required. The limitations addressed by this project are introduced in an advanced Medicinal Plant classification System using Deep learning and Ensemble modeling techniques. The system first utilizes the VGG16 convolutional neural network CNN, which is fine tuned to recognise various medicinal leaf structures with high accuracy. From this foundation, we propose a novel ensemble model with four of the most powerful architectures VGG16, ResNet50, MobileNetV2, and EfficientNetB0 to address these concerns in order to improve robustness, decrease bias and improve the overall classification accuracy. We take an ensemble approach by combining the strengths of one model with the other complementary models which leads to better generalization with respect to different plant species. In addition, a Flask based web interface is added to the system, which allows users to upload leaf images, and instantly gets the classification results, together with detailed medicinal information. The chatbot, based on neural networks and natural language processing (NLP), is integrated to provide detailed responses of therapeutic uses, health benefits and side effects of the identified plants, in order to enrich the user experience. By joining image classification with interactive, AI, the platform is much more than a streamlining of plant identification, it is also educational and acts as a tool for educating, promoting awareness and access in the field of herbal medicine. This holistic system was designed to enable botanists, health care professionals and the general public to be confident and scientific and use natural remedy.

### **396. DISEASE PREDICTION USING MACHINE LEARNING: A DATA DRIVEN APPROACH**

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With the high growth of healthcare data, machine learning (ML) has become an important tool in disease prediction and diagnosis. This research shows a data driven approach for predicting diseases using four ML algorithms—Naïve Bayes, Decision Tree, Random Forest, and K-Nearest Neighbor (KNN). A comprehensive dataset covering 50 diseases is collected and pre-processed to train and evaluate the models. Feature selection techniques and data augmentation methods are employed to enhance model performance and generalizability. Comparative analysis of the algorithms conducted is based on accuracy, precision, recall, and F1-score to determine the most effective model for disease prediction. The study also acknowledges key challenges, such as data imbalance, model interpretability, and ethical considerations in healthcare AI area. By leveraging structured and unstructured medical data, this research contributes for the advancement of data-driven disease predictions, offering insights into optimizing machine learning applications in healthcare.

### **397. SUB-SYNCHRONOUS RESONANCE (SSR) ANALYSIS IN INDUSTRIAL POWER NETWORKS**

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Sub-Synchronous Resonance (SSR) is an important phenomenon caused by the interaction between the electrical networks and mechanical systems of rotating machines at sub-synchronous frequencies. Though SSR has been thoroughly researched in large power transmission systems with series compensation, its effects on industrial power networks are yet to be thoroughly investigated. Industrial networks, comprising large synchronous machines, capacitor banks, and power electronic converters, are highly prone to SSR owing to their dense and sensitive topologies. This paper investigates SSR behavior in an industrial network using time-domain simulations in PSCAD. A 120 MVA synchronous generator connected through a step-up transformer to a faulted transmission line is modeled. A three-phase-to-ground fault is introduced and cleared using timed breaker logic to observe system response. Current waveforms reveal sustained sub-synchronous oscillations following fault clearing, indicating the presence of SSR. These oscillations, observed in the fault current, are analyzed to determine system stability and vulnerability. The study demonstrates how fault conditions and breaker clearing times influence the excitation of SSR modes in industrial setups. Results highlight the need for effective mitigation strategies such as damping controls and series compensation tuning. The findings underscore the importance of incorporating SSR analysis into the planning and protection of industrial power systems.

### **398. OPTIMIZING AADHAAR CENTERS IN JAMMU AND KASHMIR USING NIGHT LIGHT AND CENSUS DATA**

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The geographical position of Aadhaar enrollment centers performs a certain task of ensuring equalizing chances to obtain services and benefits of government for the people of Jammu and Kashmir, known for specific features of the territory and socio-political environment. The proposed method which involves the incorporation of the night lights data along with census demographics using machine learning technologies achieves the goal of the optimal placement of Aadhaar centers in J&K, i.e. Jammu and Kashmir. By working with machine learning algorithms, we analyze night light data in the form of satellite imagery, to identify areas that have been developed either slow, medium, or fast. Furthermore, we use census data to assess the distribution of population among the different regions as well as to detect shifting demographic tendencies these regions share. This is done using clustering algorithms and geospatial analysis which discover the best placement of Aadhaar kiosks, thereby minimizing the travel distance and ensuring the whole population has been covered, based on parameters like population density, infrastructure availability, and socio-economic indicators. The presented model with the use of data, guarantees rational decisions by administrators and policymakers on the placement of Aadhaar centers in Jammu and Kashmir thus increasing service delivery and participating everyone

in the process. The proposed clustering approach has yielded a silhouette value of 0.8615 for the level of urbanization and 98.13 % for the selection of centers indicating about its reliability. It is a quantitative model for policy makers that leads to substantive improvements in the delivery of services that strengthens regional equity in the state of Jammu and Kashmir.

### **399. SMART BOOKING SOLUTIONS BLOCKCHAIN-POWERED PROPERTY BOOKING AND PREVENT FRAUD BOOKING**

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The traditional land registration system in India involves brokers who manually prepare documents and facilitate transactions between buyers and sellers. This process is time-consuming, insecure, and vulnerable to fraud and corruption due to physical documentation and centralized control. To overcome these issues, we propose a blockchain-based land registration system using Hyperledger. This decentralized approach ensures transparency, security, and integrity of property transactions by automating processes with smart contracts and eliminating intermediaries.

### **400. PREDICTING DIABETIC FOOT ULCERS: A DEEP LEARNING APPROACH USING EFFICIENT NET**

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Diabetic foot ulcers (DFUs) are one of the most common and serious complications of diabetes, affecting 15% to 25% of diabetic individuals worldwide. If left untreated, they can lead to severe outcomes such as amputations. However, due to a lack of awareness about the consequences of diabetes, many patients fail to detect or manage these ulcers in the early stages, which worsens their condition. In return, this research recommends the application of Efficient Net, a deep neural network model, to offer early detection and prognosis of diabetic foot ulcers. Using Efficient Net on a database of 1000 foot images, including healthy and ulcerated diabetic feet, the model performed extremely well. Efficient Net performed better compared to conventional models such as Resnet50, DenseNet121 with a highest accuracy of 98.97%, F1-score of 98%, and precision of 99%. These findings show that Efficient Net, through its efficient scaling of network width, depth, and resolution of the image, is very effective at diabetic foot ulcer detection and thus presents a great solution for early detection and prevention of amputations in diabetic patients. This strategy may prove to be essential in enhancing the outcomes of patients and lowering the cost of healthcare by making diagnostic tools more affordable, accessible, and accurate.

### **401. AUTOMATIC ACCIDENT DETECTION AND AMBULANCE ALERT SYSTEM FOR TWO WHEELERS**

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Road accidents are among the leading causes of death globally. Timely emergency response plays a critical role in saving lives, but existing systems often fail to detect accidents instantly or deliver precise location data to responders. This paper presents an IoT-based Automatic Accident Detection and Emergency Alert System that utilizes smart sensors, real-time tracking, and cloud integration to detect accidents and instantly notify emergency contacts and services. The system consists of three main modules: Alert Module, Location Module, and IoT Integration Module. Each module performs distinct but interconnected roles to ensure accurate accident detection, real-time location sharing, and efficient communication with emergency services. The system also incorporates AI and ML algorithms for data analysis, enhancing road safety by identifying accident-prone areas.

#### **402. ENERGY-EFFICIENT BEAMFORMING IMPLEMENTATION FOR MASSIVE MIMO SYSTEM IN VLSI**

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With the proliferation of 5G networks and the exponential growth of communication devices, enhancing communication quality has become imperative. Adaptive digital beamforming, which adjusts radiation beam pattern of an antenna array based on the desired received signal, plays essential role in this enhancement. The Least-Mean-Squares (LMS) algorithm is widely adopted for its balance between computational efficiency and accuracy. This paper presents an FPGA-based implementation of adaptive digital beamforming for Massive MIMO systems using the LMS algorithm, tailored for the Xilinx Virtex-6 FPGA and Xilinx ISE 14.7. The proposed design achieves significant reductions in power consumption and latency while maintaining high throughput is making it well- suited for next-generation wireless communication networks.

#### **403. REAL-TIME MEDICAL INVENTORY AND AI-BASED DEMAND FORECASTING FOR SUSTAINABLE HEALTHCARE**

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The system seeks to transform the supply and management of medical products by integrating real-time inventory monitoring and AI-based demand forecasting, enabling key healthcare resources to be made

available seamlessly. The system tracks stocks in real time and updates inventory automatically across hospitals, pharmacies, and other health facilities, avoiding shortages and overstocking. It forecasts future supply requirements based on patient data, enabling proactive re-supply of stock. In the event of potential shortages, the system performs hierarchical searching across hospitals, medical stores, and the surrounding areas to identify available supplies, prioritizing replenishment of stock from suppliers with available stock and longer expiry dates to avoid wastage. The platform is flexible, enabling the management of vaccine supply, surgical kit, and other hospital consumables, optimizing the deployment of resources in routine and emergency cases. With an emphasis on optimizing supply chain efficiency, the system improves emergency preparedness, reduces wastage, and maximizes the overall health-care supply chain resilience. Its major advantages are the avoidance of wastage of medicines and consumables, timely availability of essential supplies, improvement in health-care operations efficiency, and contribution to a more efficient and reliable healthcare supply chain environment.

#### **404. SMART TRAFFIC SIGNAL OPTIMIZATION USING REAL-TIME IMAGE PROCESSING AND MACHINE LEARNING**

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This proposed system presents an intelligent, real-time traffic management system designed to optimize traffic signal timings using advanced image processing and machine learning (ML) techniques. A camera module captures live traffic images, which are analysed using a YOLOv8-based ML model to detect and count vehicles, assess vehicle density, and evaluate road conditions. The image data is processed and handled by the ESP32 microcontroller, which plays a central role in data integration, analysis, and signal control. Based on the traffic conditions, the system dynamically adjusts signal durations, significantly reducing congestion and improving the flow of vehicles at intersections. The system also sends real-time vehicle count data to ThingSpeak, enabling remote monitoring and data visualization. By combining hardware and AI-powered analytics, the system ensures a more responsive and adaptive traffic control solution. It demonstrates strong potential for real-world deployment in smart cities, contributing to safer roads, reduced delays, and enhanced urban mobility through intelligent infrastructure integration.

#### **405. A ROBUST FRAMEWORK FOR LICENSE PLATE RECOGNITION FROM BLURRED IMAGES**

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This paper describes a method for automatically recognizing license plates and extracting text from images of vehicles. The suggested approach utilizes yolov11, a cutting-edge object detection model, to precisely identify the regions containing license plates within an image. Following successful plate detection, the extracted plate image undergoes a series of preprocessing steps, including grayscale conversion, contrast enhancement using CLAHE, noise reduction, sharpening, and adaptive thresholding, to optimize it for optical character recognition (OCR). To ensure accurate text extraction, a hybrid approach that combines PaddleOCR and tesseract is utilized. PaddleOCR is the main OCR



engine, while tesseract is used as a backup to improve recognition accuracy in different image conditions. The extracted text is thoroughly cleaned and verified to guarantee a valid license plate format. This system provides an efficient method for LPR by utilizing a robust detection model and a resilient OCR pipeline, showcasing its potential for use in traffic management and security systems.

#### **406. MEDISHIELD: SECURING AND ANALYZING MEDICAL IOT DATA**

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A combination of blockchain technology with CNNs could unlock an entire new frontier in the IoMT space: ensuring data security and accuracy while raising the bar for efficiency in decision-making processes when it comes to diagnosing medical cases. The IoMT, or IoT for the Medical Field, is the connected ecosystem of medical devices, sensors, and healthcare systems that are connected together, sharing data across the Internet. Thus, it enables real-time monitoring and remote patient care through better decision-making associated with healthcare. Contrasting that, while the number of connected devices is growing, another crucial aspect that needs serious consideration is security, privacy, and authenticity of the medical data being forwarded. Blockchain ensures an immutable, secure, decentralized architecture to protect patient data in every transaction seamlessly and securely without the use of any single trusted entity. While medical diagnosis is one of the major applications, CNN forms a very important part of deep learning algorithms that serve the purpose for studying visual data. The well-known ways in which CNNs are powerful to handle big sets with complex data include pattern recognition of medical images through X-rays, MRI, and CT scans. Placed in the IoMT context, CNNs enhance functionality for smart medical devices regarding self-diagnosis, image analysis, and pattern recognition-applications that enable fast and more precise medical interventions. The integration of blockchain with CNNs in IoMT solves many big challenges that relate to the state of affairs in the healthcare industry in multiple ways. While blockchain provides integrity and security at all levels of autonomous devices independently, CNNs provide computing powers needed in medical imaging and diagnostics at high levels. All these work together to achieve safe, accurate, and efficient health-care

delivery with better patient outcomes and increased confidence in the use of connected medical systems. There is a great hope with integration for future changes in medical technologies involving real-time AI-driven healthcare solutions secure and very intelligent.

#### **407. COMMUNITYLINK: LEVERAGING AI, GEOLOCATION AND DATA ANALYTICS FOR LOCAL EVENT CONNECTIVITY**

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In today's digital world, discovering and engaging with local events remains challenging due to scattered information and the absence of personalized discovery tools. Users often face generic listings that ignore individual interests, social networks, and geographic proximity, leading to disengagement and missed opportunities for community participation. CommunityLink addresses this issue by offering an AI-driven platform that combines Artificial Intelligence, Geolocation, and Data Analytics to deliver hyper-personalized event recommendations. The system learns user preferences and behaviors in real time, generating context-aware suggestions based on both social and location data. Additionally, CommunityLink supports event organizers with powerful analytics to understand audience trends, refine outreach strategies, and enhance planning. Its modular framework includes user profile management, geolocation-based event tracking, a smart recommendation engine, and an organizer dashboard—collectively working to bridge the gap between local events and community members, ultimately fostering stronger connections and promoting cultural engagement.

#### **408. SMART VERIFY - A SECURE ONLINE SELLER VERIFICATION PORTAL**

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This project introduces a secure verification system for property sellers, allowing them to digitally confirm their consent to sell a property through our platform. The system leverages advanced technologies like Artificial Intelligence and Blockchain to ensure that the seller's consent is authentic, verifiable, and tamper-proof. Consent is captured through a video recording and digitally signed, then securely stored on the blockchain. This provides immutable proof that the seller willingly agreed to the transaction. Our AI-powered system also analyses the video for signs of coercion or distress, and if detected, flags the case for manual verification to ensure transparency. This process protects both governments and buyers from future legal disputes where sellers might later claim they were forced or unaware. All verifications are conducted in real-time and facelessly, making the process both secure and efficient.

#### **409. DECENTRALIZED AI DATA LABELING: FULL-STACK WEB2 CROWDSOURCING PLATFORM WITH BLOCKCHAIN-BASED MICROPAYMENT SERVICE**

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While high-quality labeled datasets have been in increasing demand with the rise of artificial intelligence, traditional centralized labeling platforms have faced challenges in scalability, transparency, and operational costs. This paper proposes a data labeling platform for AI that is decentralized and incorporates Web2 technologies along with blockchain infrastructure, cloud storage, and AI-driven validation mechanisms. This system has a comprehensive full-stack interface built using Next.js alongside a PostgreSQL database that Prisma ORM manages. It also includes smart contracts on the Solana blockchain network to facilitate decentralized micropayments. With the accessible web interface accessible to all worldwide contributors, they instantly label data without any fees and transparently compensated through blockchain payment transactions. ETL-Extract-Transform-Load procedures permit handling of big datasets; vector embeddings accompanied by similarity search in vector databases support advanced quality control and semantic consistency rather than quite too. The platform applies transfer learning for intelligent labeling assistance while data cleaning pipelines are implemented with support from AI and active learning strategies. The experimental results prove the efficacy of the system regarding label accuracy, transaction transparency, and scalability; hence it can be considered as an appropriate solution under secure, decentralized cost-effective data annotation for real-world AI applications.

#### **410. VIRTUAL LAB : ENABLING PRACTICAL LEARNING IN A VIRTUAL SPACE**

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Practical science education is an essential part of school education, but physical laboratory access is still scarce in most educational institutions owing to financial, infrastructural, or geographical limitations. This paper introduces Virtual Lab: Facilitating Practical Learning in a Virtual Environment, an in-teractive learning web platform for 10th-grade students of ICSE, CBSE, and SSC boards. The platform replicates a vast variety of curriculum-specific experiments in Physics, Chemistry, and Biology and allows students to perform and visualize experiments in a safe, digital setting.

Written with React.js for the front end and Spring Boot for the backend, the platform is built to provide high performance and accessibility across devices. The simulations provide instant feedback, guided steps, and easy controls, making it perfect for both independent learners and classroom use. By simulating real-world laboratory settings, the virtual lab serves to close the gap between theoretical knowledge and application while avoiding the risks and limitations of physical laboratories. This paper discusses the design, development, and educational advantages of the platform, noting its potential in enhancing student engagement, conceptual understanding, and equal access to practical science education. The platform is adaptable and scalable with possibilities for integration into various languages and regional syllabi. The ease of use facilitates inclusive learning among diverse groups of students across India.

#### **411. LORAWAN BASED SMART MONITORING AND ALERT SYSTEM FOR ENHANCING SAFETY IN MINING INDUSTRY**

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Employee safety, in whatever industry, but particularly at the mining level, is one of the most significant factors to be weighed by companies. It is crucial, both for the employee's well-being and overall corporate well-being. Fresh, clean air is essential to the good health and well-being of mining workers. There is a traditional model of the smart system for the mining sector that has been built, which incorporates a LoRa-based solution for identifying dangerous incidents in the mine environment. The prototype developed is capable of perceiving the quality of air, humidity, temperature, dust levels, smoke, and possible landslides. Air quality is measured by the level of saturation of hazardous gases like methane through an MQ4 gas sensor. Atmospheric humidity and temperature are sensed through a DHT11 sensor. Optical dust sensing is incorporated to track the level of airborne particulate matter, while a smoke sensor is provided to sense the level of combustion-related hazards. Flame and accelerometer sensors are employed to track fire accidents and landslides in mining areas. The Internet of Things (IoT) is used to generate automatic responses and notifications to dangerous incidents. The setup has two parts: the Transmitter Module and the Receiver Module, which are connected through LoRa using IoT (LoRaWAN). The transmitter module has a microcontroller along with different sensors and a LoRa wireless transmitter, whereas the receiver part has a microcontroller with a LoRa receiver and Wi-Fi. The monitoring section includes an on-line web server for real-time parameter monitoring and emergency notification in case a miner faces a critical situation. As a mitigation to this issue, we advocate for the installation of a broad monitoring system in mining sectors. From the data obtained from monitoring, instant responses can be taken, and control measures can be adopted according to event patterns. The effect of control measures can also be properly evaluated.

#### **412. RECIPE MAKER ACCORDING TO THE AVAILABLE INGREDIENTS**

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This paper outlines the development of a Recipe Finder Web Application built using HTML, CSS, and JavaScript. Unlike traditional mobile or Python-based applications, this solution is entirely client-side and leverages the public MealDB API to dynamically retrieve and display recipes. The application allows users to enter one or more ingredients and returns a list of recipes that match the input. Each recipe includes a thumbnail image, title, and a button to view full preparation instructions, category, and an embedded video link. The backend infrastructure is simplified due to the design's reliance on external APIs, making the system lightweight and well-suited for quick and efficient use.

#### **413. PERSONALIZED DIAGNOSTIC APPROACHES FOR CUTANEOUS DISORDERS**

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Cutaneous disorders refer to a broad spectrum of skin conditions, ranging from common conditions such as acne and eczema to more unusual ones, for example, psoriasis or cutaneous lymphoma. The traditional method of diagnosis in these entities has depended on clinical examination, histopathological examination, and laboratory tests. AI and ML can also transform diagnostics by analyzing an enormous amount of data from clinical records, imaging studies, and lab results, and predicting and making differential diagnoses faster than traditional diagnostic methods. In conclusion, personalized diagnostic approaches signify a paradigm shift in dermatology, away from a one-size-fits-all model and toward a more individualized, patient-centric approach. Given that progress in genomics and AI, coupled with that in the field of digital health, provides much promise, diagnosing individuals with precision regarding early detection and targeted therapies will finally reduce cutaneous disorders and enhance the quality of life of the patients.

#### **414. MULTIPLE CRITERIA OPTIMIZATION OF REBAR DESIGN IN CONCRETE STRUCTURES USING NSGA-II: A SUSTAINABLE APPROACH**

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Reinforcing bar (rebar) arrangement optimization in concrete structures is a difficult problem of structural engineering that requires a trade-off between several frequently opposing performance requirements. Conventional design procedures put emphasis on safety and conformance to design codes but may ignore the possibility of improving efficiency, cost savings, and environmental sustainability. This paper presents a robust multi-criteria optimization (MCO) framework that utilizes evolutionary algorithms in the form of the Non-dominated Sorting Genetic Algorithm II (NSGA-II) to produce optimum rebar configurations. The framework takes into account important criteria like cost minimization in construction, maximization of structural performance (load-carrying capacity and crack resistance), and minimization of environmental impact in terms of lower carbon emissions. The optimization process is designed with design constraints from commonly accepted codes, such as ACI and Eurocode, to address code compliance and constructability. A simply supported reinforced concrete beam case study is employed to present the application of the proposed approach. Results exhibit a distinct Pareto front of best solutions and reflect the optimization trade-offs between the chosen criteria, pointing to the strengths of MCO in defining operative and sustainable rebar design options.

#### **415. PREDICTIVE MAINTENANCE OF INDUSTRIAL EQUIPMENT USING HYBRID DEEP LEARNING AND REINFORCEMENT LEARNING MODELS**

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Predictive maintenance has become an indispensable strategy in modern industrial environments where minimizing unexpected equipment failures and reducing maintenance-related downtime are critical to operational efficiency and cost control. Traditional preventive maintenance methods, while effective to a certain extent, often rely on static schedules or simple threshold-based triggers that may not account for the dynamic and evolving nature of equipment wear and operational conditions. In this research, we propose a hybrid framework that integrates Deep Learning (DL) and Reinforcement Learning (RL) techniques to create a more adaptive and intelligent predictive maintenance system. Specifically, Long Short-Term Memory (LSTM) networks are employed for time-series failure prediction, leveraging their ability to capture temporal dependencies in sensor data and accurately forecast potential equipment breakdowns. To complement this, a Deep Q-Network (DQN) is implemented to model and optimize maintenance decision-making, enabling the system to learn and adapt policies that balance preventive maintenance actions with operational continuity. The framework is trained and validated using a rich industrial dataset containing sensor readings such as temperature, torque, rotational speed, and tool wear. A comparative evaluation is conducted against traditional machine learning models, including Random Forest (RF) and Support Vector Machines (SVM), to assess the performance gains achieved through the deep learning and reinforcement learning integration. The experimental results demonstrate that the proposed hybrid model significantly outperforms baseline approaches in terms of prediction accuracy and maintenance efficiency. By intelligently scheduling maintenance and proactively identifying failures, the model contributes to minimizing downtime, optimizing resource allocation, and achieving substantial cost savings for industrial operations.

#### **416. DETECTION AND CLASSIFICATION OF DIABETIC RETINOPATHY WITH VAE-BASED IMAGE COMPRESSION THROUGH ENHANCED DEEP LEARNING ALGORITHMS**

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Diabetic Retinopathy (DR) is one of the leading causes of blindness globally and continues to pose a serious public health concern. The need for precise, effective, and scalable automated diagnostic systems is greater than ever since controlling the course of a disease depends on early intervention. In this study, we present a hybrid deep learning framework that combines the benefits of Variational Autoencoders (VAE) for image compression and EfficientNetB0 for the accurate classification of DR severity. First, a VAE is used to compress high-resolution retinal fundus images, effectively reducing processing and storage costs without compromising diagnostic quality. An EfficientNetB0 classifier receives these compressed representations and categorizes the input into one of five clinical stages: proliferative, mild DR, moderate DR, severe DR, and healthy. This two-stage pipeline enhances performance by focusing the classification task on the most important visual features and minimizing noise and redundancy in the raw image data. This dual-stage pipeline enhances performance by focusing the classification task on the most meaningful visual features, minimizing the noise and redundancy present in raw image data. By reducing noise and redundancy in the raw image data and concentrating on the classification task, the most crucial visual features are obtained and this two-stage pipeline improves performance. Five popular CNN architectures VGG16, ResNet50, DenseNet121, InceptionV3, and EfficientNetB0 were used to thoroughly evaluate performance. With a 96% validation accuracy and a 97% training accuracy, the EfficientNetB0 model performed better than the others in

terms of accuracy, precision, recall, and F1-score. Additionally, a combined tabular analysis and comparative graphs provide ample evidence of the superiority and efficacy of the proposed method. The proposed method integrates classification and compression into a single pipeline.

#### **417. SMART LABORATORY ASSISTANT**

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**Automates Laboratory Cleaning:** Uses sensors and automated cleaning mechanism to sweep, mop, and disinfect to ensure hygiene and cleanliness. To create a Smart Laboratory Assistant – an Autonomous Cleaning Robot that can intelligently detect and eliminate dust, spills, and contaminants from laboratories using a sensor-based navigation system, image acquisition system, and an automated cleaning system. The ESP32 will be leveraged for control and communication, though if required, one can always add external processing (cloud/edge AI) for image processing. **Navigation:** For navigation, we use ultrasonic sensors to detect obstacles and acquire images to identify dirty areas. **Area Specific Cleaning Solution:** Built-in spray system, water pump, sponge to clean lab areas. **Remote Monitoring & Control:** Allows monitoring and control via ESP32 in real time, with cloud-based integration to boost control. **Improves Efficiency & Safety:** Minimizes effort, standardizes cleanliness, eliminates cross-contamination for safe labs.

#### **418. AI BASED OCR SOLUTION FOR DIGITIZING AND TRANSLATING TAMIL HANDWRITTEN TEXTS**

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This research proposes a system to digitize documents written by hand into regional languages, increasing their accessibility and ease of use. The system integrates EasyOCR with a Convolutional Recurrent Neural Network (CRNN) for reliable text extraction from scanned images, utilizing confidence thresholding to enhance accuracy. The CRNN, trained on diverse handwritten datasets, refines character recognition by capturing spatial and sequential dependencies in text. Fusion-based Confidence thresholding filters out low-certainty predictions, reducing errors in extracted text. The extracted text undergoes precise language translation via machine translation APIs and is subsequently formatted to plain texts. This effort digitizes not only serves the purpose of preserving the cultural heritage but also promotes social equity by making the handwritten documents available for consideration by researchers, educationists, and the general public all over the world and helps in enriching the socio-historical knowledge and understanding.

#### **419. ENHANCING AI-BASED HERITAGE EXPLORATION THROUGH PERSONALIZATION AND ENGAGEMENT**

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HistoriX is a next-generation mobile application designed to revolutionize the way people explore and engage with the cultural and historical heritage of Tamil Nadu. The app aims to bridge the gap between technology and tradition by offering an immersive, intelligent, and user-friendly platform that enhances the travel and learning experience for both locals and tourists. By integrating AI-driven personalization, multilingual chatbots, and interactive maps, HistoriX transforms conventional heritage tours into engaging, accessible, and interactive journeys. One of the app's unique features is the District Canvas, which showcases heritage sites in a district-wise layout, allowing users to discover, bookmark, and learn about landmarks effortlessly. The AI-powered chatbot acts as a personal heritage assistant, providing instant, context-aware information in both Tamil and English, supporting text and voice interactions to ensure inclusivity and ease of use. The application also features real-time navigation with offline map accessibility, proximity alerts, and event notifications, helping users stay updated on cultural events, festivals, and special occasions happening in nearby areas. HistoriX emphasizes community-driven content sharing, encouraging travellers and local residents to contribute photos, reviews, and stories, creating a collaborative platform that preserves oral histories and personal experiences. Designed with accessibility at its core, HistoriX incorporates text-to-speech features, voice-enabled navigation, and multilingual support, making it inclusive for users with disabilities and those from diverse linguistic backgrounds. By combining cutting-edge technology with cultural storytelling, HistoriX not only enhances tourism but also promotes sustainable, community-based heritage preservation. In essence, HistoriX is more than a travel guide — it is a cultural companion that celebrates Tamil Nadu's legacy, fosters connections between history enthusiasts and local communities, and ensures that the state's timeless traditions and stories are preserved, experienced, and cherished by future generations.

#### **420. DEEP LEARNING TECHNIQUES ON ANALYZING MENTAL HEALTH ISSUES AMONG YOUNGSTERS**

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The given project deciphers on implementing deep reinforcement learning with natural language processing (NLP) to describe the mental health issues among pre-teens, teens and youngsters. Based on the recent trends, which vary from societal, psychological and behavioral issues and the rise in various mental health disorders after the COVID-19 pandemic, the project offers techniques to detect those varied issues within the younger demographic.

#### **421. ENTREPRENEURIAL HUB – A PLATFORM FOR ALL BUSINESS NEEDS**

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Entrepreneurship plays a vital role in fostering innovation and contributing to the global economy, especially in rapidly developing ecosystems like India, which ranks third globally with over 90,000



start-ups. Yet, many founders face hurdles in registering businesses, accessing funding and building meaningful connections. The study proposes an innovative solution to support start-ups by bringing entrepreneurs, government officials, angel investors, venture capitalists and consumers onto a single cloud-based SaaS platform. This user-friendly system simplifies the start-up registration process and provides real-time status updates, making it easier to apply under schemes like Start-up TN, Start-up India and Department for Promotion of Industry and Internal Trade (DPIIT). Entrepreneurs can upload necessary documents, which are verified using AI-powered Optical Character Recognition (OCR) and Aadhaar authentication through Unique Identification Authority of India (UIDAI). Role-based dashboards help government officials manage approvals, while angel investors and venture capitalists (VCs) can explore verified start-ups and receive personalized recommendations based on their interests. Consumers can browse and support start-up products directly. The platform ensures secure, transparent and scalable operations by using cloud infrastructure and real-time notifications to streamline communication and boost collaboration across all stakeholders

## **422. IOT-BASED REAL-TIME ACCIDENT DETECTION AND EMERGENCY ALERT SYSTEM USING GPS AND GSM**

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Effective accident detection techniques are essential for improving safety and expediting traffic management in smart cities due to the dynamic and unpredictable nature of road traffic. In addition to providing a thorough overview of various traffic accident types, such as rear-end collisions, T-bone collisions, and frontal impact accidents, this paper provides an in-depth investigation study of popular accident detection techniques, illuminating the subtleties of other cutting-edge approaches. This framework reduces delays and congestion by dynamically adjusting traffic signals to prioritize emergency vehicle movement through integration with current traffic management systems. Even in noisy urban settings, the system's stacking ensemble model combines neural networks to provide accurate and dependable detection. This framework reduces delays and congestion by dynamically adjusting traffic signals to prioritize emergency vehicle movement through integration with current traffic management systems. Compared to the logistic regression and SVM models, the random forest model is the most successful in this regard and provides a classification that is almost perfect. The SVM model and logistic regression performed poorly with the minority classes. Once more, the application of that integrated application has used the model, and the outcome will be better in prioritizing the medical emergency request and providing a sound response. For instance, crowd density indoors, lighting, and GPS coordinate accuracy could all be an additional drawback. The paper's overall goal is to use GPS to locate the location of our vehicle's collision. These days, accidents still account for a large number of them. This is the outcome of particular human actions. Every day, technology has made our lives easier. Among these behaviors are driving under the influence, exceeding the speed limit, breaking traffic laws, etc. In the event of an accident involving our car, the global positioning system (GSM) GPS module will send a location-based alert to our phone number, enabling us to promptly arrive and possibly save their lives. The goal of this project is to stop fatal accidents. We give a thorough description of the parts we used, including the Arduino Nano, in this paper. The following years can see the development of this project. Our paper will be devoted to the solution of such problems. Several steps were taken by our administration to reduce the accident. In order to determine the vehicle's speed and impose a fine, they had placed specialized monitors in the signal.

### **423. DATA EXFILTRATION DETECTION SYSTEM**

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This project develops a Data Exfiltration Detection System that monitors network activities to identify potential data breaches. It includes three detection modules: a web traffic analyzer for suspicious file uploads, a network monitor for abnormal data transfers, and a log scanner for unauthorized access. Built with Python, Flask, and SQLite, it uses rule-based algorithms to evaluate security events and generate real-time alerts. The system features an interactive dashboard, supports REST API integration, and provides scalable future expansion options, such as machine learning and cloud monitoring. It aims to prevent data loss while maintaining low false positives and improving proactive cybersecurity.

### **424. DESIGN AND SIMULATION OF A MULTIBEAM SPARSE CIRCULAR-ARC ANTENNA ARRAY FOR KU-BAND APPLICATIONS USING CST STUDIO SUITE**

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This paper covers the design and simulation of an antenna array with multiple beams in the conformal circular arc application using CST Microwave Studio. The array consists of a compact E-shaped microstrip patch antenna element that was designed to operate at around 13 GHz. The patch element is affixed to a cylindrical surface and then the patch antennas are configured into an array as multiple E-patch antennas distributed along a circular arc from  $-75^\circ$  to  $+75^\circ$ . The E-patch antenna offers a wide bandwidth as a conformal microstrip design because the slot introduced by the E-patch allows the surface currents to travel over a wider path length, which increases the impedance bandwidth and improves the radiation performance. Each of the elements should always be excited via the coaxial feeding option in CST Microwave. The antenna generated stable and unidirectional beams at a constant gain with low levels of sidelobes. Mutual coupling is probably low with proper spacing between the elements and with their unidirectional orientation as shown before. The array produced a return loss (S11) of better than  $-10$  dB, as well as a peak gain around 10 dBi per beam and a beamwidth of approximately  $14^\circ$  for multibeam applications. The quantity of cross polarization is well controlled and the levels of sidelobes are better than  $-16$  dB. The research does not use any complicated optimization methods but produces all results straightforwardly using practical CST simulations. Since we use practical CST simulations, it is a straightforward matter of fabrication and integration into real-world systems. This antenna array can be used in Ku-band applications such as satellite communication, radar and phased array.

### **425. DEVELOPMENT OF H ORDER CURVE BASED RECONFIGURABLE ARRAY ANTENNA FOR IOT APPLICATIONS**

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This paper presents the design and simulation of a 1x2 microstrip patch array antenna with H-order curve slots for reconfigurable operation at 5 GHz and 2.4 GHz, catering to IoT-based smart city and industrial applications. The antenna is fabricated on an FR4 substrate with a dielectric constant of 4.4 and a thickness of 1.6 mm. H-order curve slots modify the surface current path, enabling frequency tuning, while PIN diodes provide active switching between 5 GHz and 2.4 GHz. The proposed design achieves a return loss of -22 dB at 5 GHz and -18 dB at 2.4 GHz, with respective gains of 7 dBi and 5 dBi. The radiation pattern at 5 GHz is directional for high-speed data transmission, while at 2.4 GHz, it offers wider coverage for better penetration. Simulation results confirm the antenna's efficiency in achieving stable radiation, high gain, and low return loss at both operating frequencies, demonstrating its potential for dynamic wireless communication systems.

#### **426. THE OPTIMIZED NEURAL NETWORK FRAMEWORK FOR HOLISTIC ON-FIELD AND OFF-FIELD PERFORMANCE EVALUATION OF FOOTBALL PLAYER**

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In professional recruitment of football players the key determinant relies on both sporting accomplishment and commercial possibility. Traditional evaluation systems mainly focus on the technical as well as on-field performance metrics. These metrics are not holistic as they often overlook the in-creasing demand to incorporate off-field factors such as influence created due to fan engagement and public sentiments. This paper proposes O2F (On-field + Off-field Factor), a comprehensive player acquisition metric that will combine performance statistics through On-field metrics with off-field metrics like sentiment analysis from social media platforms. By integrating data from sources like Sofascore, Sofifa, Twitter, and Reddit, we construct a multidimensional dataset. A neural network model is employed to analyse this data, with optimization algorithms such as Particle Swarm Optimization (PSO), Genetic Algorithm (GA), and Differential Evolution (DE) used for further tuning the scores. The model is further validated through post-facto analysis by comparing O2F evaluations with historical player recruitment decisions. The results demonstrate that our proposed model is robust and scalable approach that is relevant in modern football scouting and talent acquisition.

#### **427. CEREBRODX- BRAIN TUMOR DETECTION AND REPORT GENERATOR USING CNN**

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Brain tumors are one of the most difficult diseases to diagnose, early and accurate detection can have a positive impact on patient results. CerebroDx is a proposed smart classification, and report generation tool to identify brain tumors using Convolutional Neural Networks (CNN) hosted in a Flask web application as a solution. CerebroDx can identify four brain conditions, (which is the focus of this paper) Glioma, Meningioma, Pituitary tumors, and healthy brain tissue with such high accuracy. CerebroDx achieved accuracy of 98.5% during training, 97.2% during validation, and 96.8% during independent testing. The easy-to-use interface allows medical professionals to upload MRI scans, then generate and download detailed diagnostic reports. CerebroDx blurs the line between deep learning technology and clinical practice.

#### **428. ADVANCED MIMO ANTENNA FOR DUAL BAND APPLICATION OF 5G AND WIFI DEVICES**

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This paper introduces a compact dual-band MIMO antenna system tailored for smartphones, ensuring strong isolation between antenna elements. The system includes eight loop antennas operating at two key frequency bands: 3.8 GHz (3800 MHz) for 5G and 5 GHz (4800–5000 MHz) for WiFi. Each antenna element is designed to be highly compact, measuring only  $6.9 \times 6.6 \text{ mm}^2$  (around  $0.08 \times 0.08$ ). The design smartly integrates two folded stubs within the smartphone frame, using an inverted L-shaped microstrip probe to excite the antenna through small gaps. Electromagnetic simulations validate that this MIMO antenna system provides exceptional element isolation of over 14.5 dB without needing extra decoupling components. Additionally, the envelope correlation coefficient (ECC) stays below 0.2 across both frequency bands, making this design a strong contender for future smartphones.

#### **429. PERFORMANCE ANALYSIS OF VARIOUS DEEP LEARNING MODELS FOR BRAIN TUMOR SEGMENTATION AND CLASSIFICATION : COMPARATIVE APPROACH.**

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Detecting the brain tumors in their early stage is crucial, as this allows physicians and experts to develop better treatment strategies and improves patients' chances to overcome any dangers pertaining with tumors. The primary objective is to precisely map out the tumor region. There have been several approaches to brain tumor segmentation. In this study, various strategies are evaluated and explained. They are thoroughly investigated and addressed in this work. The early segment of this paper involves reviewing previous research which utilized deep learning to categorize and detect brain cancers. The second segment of the paper is presented with the proposed methods performance analysis in detailed manner. The paper intends to offer future researchers with an in-depth review of current research developments and the effectiveness of various deep learning approaches. We believe that this study will significantly broaden our knowledge of brain cancers detection methods.

#### **430. ADAPTIVE DEFENSE MECHANISMS FOR DDOS MITIGATION IN SOFTWARE-DEFINED NETWORKS (SDN): A SIMULATION-BASED APPROACH**

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Software-Defined Networking (SDN) has significantly transformed network management by separating the data plane and control plane, making network easier and more flexible as in traditional networks the control and data plane will be linked tightly. However, this shift has more vulnerabilities when it comes to Distributed Denial of Service (DDoS) attacks as it overwhelms the system and disrupt network operations. This research proposes an adaptive defense system that mitigates DDoS attacks against the software-defined networks. This is elaborated on the introduction of both threshold-based detection and machine learning-based anomaly detection to enhance attack mitigation, the proposals help fine-tune the performance of the detection systems. The performance of the system is studied under simulated scenarios of DDoS attack in Mininet. The experimental set-up includes three switched topologies which are operated by POX controller. Performance metrics including accuracy, recall, precision, F1 - score are considered in order to provide an assessment of defense mechanisms employed. Simulation results provide convincing evidence of major advances in network resilience, thereby validating this approach as a viable solution for SDN environments of the real world.

#### **431. AI-POWERED SOLAR RADIANT COOLING: SMART, SUSTAINABLE CLIMATE CONTROL WITH PEX PIPING AND ACP INSULATION**

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With rising temperatures and increasing energy demands, conventional air conditioning systems are inefficient and harmful to the environment. This project introduces an AI-powered cooling system that integrates radiant cooling, AI-driven optimization, and solar energy to provide an eco-friendly, energy-efficient alternative. Using PEX pipes for radiant cooling, AI sensors for real-time optimization, and solar-powered pumps, the system reduces electricity consumption and operational costs. ACP insulation further enhances efficiency, making it ideal for high-temperature regions or areas with unreliable power. This innovative approach offers a sustainable, cost-effective cooling solution for a greener future. The proposed AI-powered cooling system leverages radiant cooling, artificial intelligence, and solar energy to create a highly efficient and eco-friendly alternative to traditional air conditioning. Unlike conventional HVAC systems that rely on refrigerants and compressors, this system circulates cooled water through PEX pipes embedded in walls or ceilings, enabling heat absorption with minimal energy consumption. AI algorithms analyze real-time environmental data, adjusting water pump speeds and motor operations to optimize cooling while reducing power usage. Solar-powered water pumps further enhance sustainability by decreasing dependency on conventional electricity. Additionally, ACP (Aluminum Composite Panel) insulation minimizes unwanted heat exchange, improving overall efficiency. The system is particularly beneficial for regions with extreme temperatures and unreliable power grids, offering a cost-effective and sustainable solution. By integrating smart automation and renewable energy, this cooling system significantly lowers operational costs, reduces carbon footprint, and paves the way for intelligent, green cooling solutions for the future. By incorporating intelligent automation and renewable energy, this innovative cooling solution significantly reduces carbon

emissions and promotes sustainability. Its scalable design makes it suitable for various applications, from residential buildings to commercial establishments. The combination of radiant cooling, AI-based optimization, and solar power offers a forward-thinking approach to climate control, paving the way for smarter, greener, and more energy-efficient cooling systems in the future.

### **432. IMPROVING HUMAN DETECTION FOR SURVEILLANCE SYSTEMS**

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Accurate and effective human detection is essential in the field of surveillance systems to improve security and guarantee prompt responses to possible threats. In this research, two cutting-edge object identification algorithms, YOLOv3 and YOLOv8, are compared. We examine how well they perform in identifying the human presence in diverse settings, paying particular attention to important parameters like robustness to occlusions, processing speed, and detection accuracy. Our test findings show that although YOLOv3 has been widely used due to its speed and efficiency, YOLOv8 outperforms YOLOv3 greatly due to sophisticated architectural improvements and optimization strategies. The findings demonstrate that YOLOv8 provides greater mean average precision (mAP) and faster inference times, making it a superior alternative for real-time surveillance applications. This study paves the path for further investigation and useful applications by emphasizing the significance of applying the most recent developments in deep learning to enhance human detection capabilities in surveillance systems. With the exponential rise in surveillance requirements across various domains such as public safety, smart cities, and industrial monitoring, the need for accurate, real-time multi-human detection and tracking systems has become paramount. This paper presents a robust solution utilizing YOLOv8, a state-of-the-art object detection model, integrated with deep SORT tracking algorithms to achieve high-precision and high-recall tracking in crowded and dynamic scenes. Compared to previous models like YOLOv3, YOLOv8 demonstrates significantly better performance in real-time environments. This paper thoroughly explores the architecture, methodology, implementation, performance comparison, and future improvements to make such systems deployable in resource-constrained edge devices.

### **433. A LITERATURE REVIEW OF THE HUMAN CAPITAL- ECONOMIC GROWTH NEXUS: THEORETICAL FRAMEWORK AND EVIDENCE**

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The purpose of this literature review is to identify the most relevant theoretical frameworks that support the human capital-growth nexus and to summarize existing research on the topic. Panel data, time series, cross-sectional research, and relevant theories form the foundation upon which this literature review is built. The primary findings, methodology, and conclusions of the selected study are analyzed to identify recurring themes and patterns for further investigation. Policymakers, researchers, and development practitioners seeking to establish methods for promoting sustainable economic growth will find the conclusions of this review to be of great value. The findings of this review underscore the well-established relationship between the development of human capital and economic growth. Research in

these areas may help us better understand the role of human capital in economic growth and support the creation of strategies to teach people to be flexible and adaptable in the future.

#### **434. PERFORMANCE ANALYSIS OF SIFT, SURF, AND ORB FOR FEATURE MATCHING ON REFLECTIVE AND TEXTURELESS OBJECTS UNDER CONSTANT ILLUMINATION**

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Feature matching is a fundamental task in computer vision, essential for applications such as image registration, object tracking, and scene reconstruction. However, matching features on reflective and textureless objects presents significant challenges due to low-texture regions and specular reflections. This paper presents a comprehensive evaluation of three widely used feature detection and description algorithms—SIFT, SURF, and ORB—focusing on their performance in matching reflective and textureless objects under constant lighting intensity. The study evaluates key metrics, including the number of detected keypoints, feature matching rate, execution time across different processing stages, and the efficiency of outlier rejection using RANSAC. Image matching is conducted on a dataset of reflective and textureless objects under controlled illumination to assess the algorithms' effectiveness in challenging environments. Experimental results reveal the strengths and weaknesses of each algorithm in terms of both accuracy and computational performance. While SIFT provides the most robust feature detection on reflective and textureless surfaces, ORB demonstrates superior speed and efficiency. This work offers a detailed comparative analysis, establishing a benchmark for selecting appropriate feature-matching algorithms in vision-based applications involving reflective and textureless objects under fixed lighting conditions.

#### **435. BLOCKCHAIN ENABLED INVENTORY MANAGEMENT SYSTEM**

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This project presents a decentralized Inventory Management System that leverages blockchain technology to enhance transparency, security, and automation in stock handling processes. The system maintains comprehensive records of stock levels, customer details, and purchase orders on the blockchain, ensuring data integrity and traceability. A key feature of the system is its ability to monitor stock levels in real time and trigger predictive analysis when quantities fall below a defined threshold. This analysis forecasts future demand and notifies the user or administrator accordingly. Upon admin approval, the system seamlessly places the purchase order through the integrated platform. Once the ordered items are marked as received, the inventory is automatically updated. By combining blockchain with intelligent alerting and automation, this solution aims to reduce manual errors, streamline supply chain operations, and offer a secure, tamper-proof inventory tracking mechanism.

### **436. AI ENABLED WELL PREDICTOR**

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The “AI Enabled Well Predictor” is a web-based system that leverages advanced machine learning algorithms to provide accurate predictions for water quality and stability, aiding in informed decision-making for water well and borewell construction. Utilizing data from authorized government repositories, the system features two key modules: water quality prediction and water stability prediction. The water quality module uses a Random Forest Regressor to estimate pH levels based on chemical properties like electrical conductivity, total hardness, and ion concentrations, achieving a mean squared error of 0.0518. The water stability module employs a LightGBM model to predict the expected lifespan of water sources using geographic and temporal data, ensuring high accuracy with a low mean absolute error. Together, these modules offer real-time insights into water suitability, enhancing the efficiency and sustainability of water resource management through an intuitive user interface and robust analytical capabilities.

### **437. DNA SEQUENCE CLASSIFIER USING MACHINE LEARNING**

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This paper introduces a novel approach to improving the accuracy and efficiency of DNA sequence classification through advanced machine learning techniques. The proposed DNA Sequencing Classifier employs state-of-the-art algorithms to categorize DNA sequences, such as species identification, with improved precision and speed. Although DNA sequencing has transformed multiple fields, including medicine and evolutionary studies, accurate sequence classification remains a complex challenge. Machine learning offers a robust solution by automating classification, identifying hidden patterns, and minimizing human error. This project focuses on refining raw DNA sequences during preprocessing and extracting essential features to serve as inputs for classifiers. Multiple algorithms are evaluated to select the most effective model. The classifier’s performance is assessed through k-mer counting and compared with existing classification techniques. This fusion of DNA sequencing and machine learning enhances genetic research, streamlines biological data processing, and promotes further discoveries in genomics.

### **438. BEHAVIORAL AND ATTRIBUTE-BASED FAKE PROFILE DETECTION USING ADVANCED ML TECHNIQUES**

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This research addresses the implementation of different machine learning algorithms in the identification of spoof social media accounts from a user attribute and behavior pattern dataset. Data preprocessing techniques such as data cleaning, normalization, and feature extraction are applied to prepare the datasets for analysis. Five different machine learning algorithms, including Support Vector Machines (SVM), Random Forest, Neural Networks, Logistic Regression, and XGBoost, are taken into account in the research. To measure the performance of each algorithm, performance measures such as precision, accuracy, recall, and F1 score are employed. Among all the algorithms taken into account, XGBoost is the best with the highest accuracy of 99.65% along with perfect precision and recall for both classes. The findings confirm the effectiveness of machine learning approaches in improving the security of social media platforms, especially in minimizing fraud activities. Also, the research determines their potential of application in digital identity verification and the development of online trust models.

#### **439. ADVANCE AI AND FACIAL RECOGNITION BASED IOT-DRIVEN SMART SAFETY SYSTEM**

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Day-to-day life is getting simpler due to the rapid growth of technology and almost everything has become digitalized and automatic. In this rapid smart dynamic era safety security is a rising concern even the safest destination become unsecured. smart home systems particularly with the advent of Internet of Things (IoT) has achieved a lot of popularity providing automation with extra security. In this project home security and control has been enhanced and assessable all over the world through internet. The system works by capturing real image of the guest through a camera positioned in the doors, then such image is checked if known person identified as known one then door open and if unknown person detected then send the person picture to the owner via internet to verify, based on input the unknown person will be allowed. Recently so many developments happen to secure the safety but the proposed method provides an age over conventional methods providing accuracy of 98%. The proposed method also capable to provide satisfactory accuracy for different properties and facilities such as banks and office. Beside this a smart lock is designed to perform locking and unlocking operations of the door when it receives such instructions from an authorized device using a wireless protocol and an android app to execute the authorization process. It also monitors access and sends alerts for the different events it monitors and some other critical events related to the status of the device. Different AI technology i.e LBPH and Eigen face with HAAR Cascade method has been compared based of 200 case to achieve more accurate fast and reliable safety system.

#### **440. INTELLIGENT DDOS MITIGATION IN SDN VIA REAL – TIME ML CLASSIFICATION**

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In modern digital infrastructures, Distributed Denial of Service (DDoS) attacks continue to pose a significant threat to the availability, reliability, and scalability of network services. Software-Defined Networking (SDN), with its centralized control and global network visibility, offers an ideal platform for implementing intelligent, real-time security mechanisms. This paper presents a lightweight, modular system for real-time DDoS detection and mitigation using optimized machine learning algorithms integrated within an SDN environment. The proposed solution extracts flow-level features from OpenFlow-enabled switches and classifies network traffic using models such as Decision Tree (DT), Random Forest (RF), K-Nearest Neighbors (KNN), and Support Vector Machine (SVM). The Decision Tree model demonstrated superior efficiency, achieving a precision of 99.82% and an F1-score of 99.87% with minimal CPU and RAM consumption. Mitigation is enforced dynamically through the SDN controller by issuing flow rules to drop malicious traffic in real time. The system is tested using the CIC-DDoS2019 dataset and validated in a simulated Mininet-RYU environment. Results indicate that the proposed architecture significantly reduces false positives, ensures sub-second response times, and supports automated traffic management without affecting legitimate network operations. This study contributes a scalable and adaptable framework for securing SDN-based infrastructures against evolving DDoS threats.

#### **441. A REVIEW PAPER ON RELATIVE IMPORTANCE INDEX & VARIOUS INVENTORY TECHNIQUES IN CONSTRUCTION PROJECTS**

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Effective inventory management is essential for minimizing costs, reducing material waste, and ensuring timely project execution in the construction industry. This review explores key inventory control techniques such as MRP, EOQ, LFL, DOQ, POQ, SDE, HML and ABC classification. It also highlights challenges like supply chain disruptions, poor procurement planning, and inefficient inventory tracking. Findings suggest that integrating digital technologies, predictive analytics, and lean management practices can enhance inventory accuracy and project efficiency. The study provides insights into best practices and future directions for optimizing inventory management in construction projects.

#### **442. TEXT EXTRACTION AND KNOWLEDGE MINING IN SEMI-STRUCTURED DOCUMENTS USING TESSERACT OCR**

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Effective text extraction and knowledge mining techniques are desperately needed, particularly for semi-structured documents with varied and irregular layouts, such as invoices, forms, and reports, whose digital recording is growing exponentially across industries. In order to extract text from these papers, this research explores the usage of Tesseract OCR, a potent open-source optical character recognition engine. The structure of the document images is improved prior to identification using several image preprocessing techniques, such as text alignment, binarization, and noise reduction, which increase OCR accuracy. Following text extraction, knowledge mining and Natural Language Processing (NLP) methods are used to arrange the unprocessed data, and extract valuable information from the text. Several semi-structured documents were used to evaluate the suggested method, and the findings showed that combining OCR with intelligent post-processing significantly increased efficiency and accuracy of the result. In industries like banking, healthcare, and education where precise and fast handling of data is important, this integration minimizes the manual labor for data extraction and helps in automated decision making. The system's success proves that when we combine OCR with smart analytics, we get effective way to handle the documents. The technology improves operational productivity and efficiency by automatically retrieving important data from the complicated documents. Furthermore, the pipeline is highly modular, which means it can be scaled to different document types and domains. In future works we can incorporate Machine Learning (ML) Entity recognition for identifying key data and layout analysis for understanding the document structure to enhance accuracy and data extraction. This project provides flexible and thorough approach to handle semi structured documents in this digital era.

#### **443. AUDIO TO SIGN LANGUAGE TRANSLATION SYSTEM USING 3D AVATAR FOR ISL**

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The provision of bridging the communication disparity between speech and sign languages is still an open challenge in the deaf and hard-of-hearing society. Current solutions mainly address speech-to-text transcription, paying no attention to the basic differences between the linguistic structures of speech and sign languages. This work gives a critical review of state-of-the-art developments in automatic speech-to-sign language translation, coping with various approaches, ranging from deep learning to statistical machine translation, rule-based systems, and Generative Adversarial Networks (GANs). The studies in the surveyed use techniques like LSTM, Bi-LSTM, Transformer-based Neural Machine Translation (NMT), and hybrid methods for text-to-sign translation. Recognition of gestures is also explored through CNNs, MediaPipe, and pose estimation models for ISL avatar creation. Although models such as Google API and Transformers attain high translation accuracy (up to 95%), there are constraints in datasets, grammar in accuracies, real-time processing, and adaptation to various sign languages. This survey outlines the primary research gaps and provides insights into future enhancements, such as dataset growth, integration of ISL grammar, and optimization of real-time performance. The findings in this paper aid in creating more accurate and expressive AI-powered sign language translators, enhancing accessibility for the deaf community in education, media, and real-world communication

#### **444. WIFI SAFETY DETECTION AND ALERT SYSTEM**

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The WIFI Safety Detection and Alert System is intended to recognize dangerous (open) Wi-Fi networks and warn users in real-time, encouraging safe browsing habits. By scanning local networks, the system labels them as secure (WPA2/WPA3) or open (unsecured) and offers complete details such as SSID, signal strength, and risk level. Users get prompt warnings regarding unsafe networks, allowing for well-informed decisions before joining. The tool utilizes Python packages such as pywifi and scapy for network scanning and matplotlib for graphical visualization of secure vs. insecure networks. It also has a QR code scanning facility for instant network credential analysis. In contrast to other solutions, this project values end-user-friendly alerts and awareness, closing the gap between enterprise-level security software and day-to-day user requirements. The compact and efficient nature provides compatibility with devices, allowing general users to increase their Wi-Fi security.

#### **445. ENHANCING LUNG CANCER DETECTION WITH NEURAL NETWORKS AND IMAGING TECHNOLOGY**

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Digital image processing has dramatically transformed medical imaging, playing a critical role in the early detection and diagnosis of diseases, particularly lung cancer. This technology employs sophisticated techniques such as image recognition, analysis, and enhancement to improve the clarity and detail of medical images, allowing for more precise identification of abnormalities. Lung cancer, being one of the leading causes of cancer-related deaths worldwide, often goes undetected until it has reached an advanced stage, making early detection crucial for improving patient outcomes. Traditional diagnostic methods, which rely on the expertise of trained radiologists, are susceptible to human error and variability, underscoring the need for automated systems that can provide consistent and accurate results. Automated detection systems leverage advanced image processing to identify cancerous tissues in medical images like Xrays, CT scans, and MRIs. These systems typically involve several key components, including image enhancement to improve image quality, feature extraction to identify specific characteristics indicative of lung cancer, and pattern recognition to classify these features as benign or malignant. By reducing dependency on human interpretation, these automated systems aim to minimize errors, increase diagnostic accuracy, and speed up the diagnostic process. Artificial neural networks (ANNs) have further advanced the capabilities of digital image processing in medical imaging. Modeled after the human brain, ANNs are adept at recognizing complex patterns and making predictions based on large datasets. In the context of lung cancer detection, ANNs are trained on vast amounts of annotated medical images, learning to associate specific patterns with the presence or absence of cancer. This training process involves data collection, preprocessing, model training, and validation/testing to ensure the network's effectiveness. Once trained, ANNs can provide high accuracy in detecting lung cancer, reducing the likelihood of false positives and false negatives. Additionally, they offer consistency in results, unaffected by human factors such as fatigue or subjective interpretation, and can process images much faster than human experts, allowing for quicker diagnosis and treatment. Despite these advantages, the implementation of ANNs and automated detection systems faces challenges, including the need for high-quality and large quantities of training data, the interpretability of the network's decision-making process, integration with existing clinical workflows,

and regulatory and ethical considerations. Addressing these challenges is essential for the widespread adoption and efficacy of automated lung cancer detection systems, which hold great promise for enhancing

#### **446. DEEPFAKE AUDIO DETECTION USING MACHINE LEARNING**

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The proliferation of deep learning technologies has enabled the creation of highly convincing synthetic audio, often referred to as deepfake audio. While these advancements open new possibilities in entertainment and virtual assistants, they also pose significant threats to security and authenticity in digital communication. This study presents a comprehensive approach to detecting of deepfake audio using machine learning techniques. Our methodology includes the preparation of robust datasets, extraction of acoustic and temporal features, and the development of a convolutional neural network (CNN) model tailored for identifying synthesized speech. The model trains on diverse dataset to generalize effectively across various deep- fake generation techniques. Our tests reveal that the model delivers impressive accuracy, precision, and recall rates, surpassing many traditional detection approaches. This study also explores issues like adversarial threats and the rapid development of synthesis methods, while suggesting innovative paths to strengthen detection resilience in the future.

#### **447. MEDICO-LEGAL RECORDS MANAGEMENT APP: A SECURE AND AUTOMATED SOLUTION FOR EFFICIENT MEDICO RECORD HANDLING**

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Medico-legal record management in healthcare faces inefficiencies due to manual processes, decentralized storage, and security risks. This paper proposes a secure and automated Medico-Legal Record Management System to streamline record handling, ensure legal compliance, and improve accessibility. The system features role-based access control, audit logging, machine learning-based record summarization, anomaly detection, and optimized search mechanisms. It enables hospitals to efficiently register patients, manage case records, and securely share documents via time-limited links or password-protected files. Developed using React Native, Node.js, and MySQL, this solution enhances data security, reduces manual human retrieval time, and optimizes medico-legal workflows.

#### **448. PROXIMITY-BASED MUSIC PAUSE SYSTEM FOR ENHANCED CAR SAFETY**

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The term “proximity sensing” describes a system or devices’ capacity to identify whether an object or a person is present within a given range without making physical contact. Reducing distractions while driving requires being aware of other vehicles and keeping an ear out for their sounds. Distractions in cars, such as music, can impair drivers’ concentration and increase the risk of accidents. The Proximity-Based Music Pause System automatically pauses music playback when vehicles approach, with the goal of improving vehicle safety. Some of the current options, like Integration, are expensive, involve manual intervention, and lack real-time detection capabilities. In order to monitor proximity data and identify close-range vehicle interactions, proximity sensor technology was introduced and integrated into the vehicle’s infrastructure in order to solve this issue.

#### **449. VISUALSURG: ENHANCING PATIENT COMPREHENSION OF SURGICAL PROCEDURES THROUGH AN INTERACTIVE WEB-BASED PLATFORM**

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A web-based platform leverages multimedia resources, including 3D visualizations, animations, and step-by-step guides, to enhance patient understanding of surgical procedures. By presenting complex medical information in an engaging and interactive format, the platform bridges the gap between intricate medical terminology and patient comprehension, allowing individuals to make more informed healthcare decisions. Healthcare providers can customize the platform's content based on specific surgical procedures, ensuring that each patient receives tailored information relevant to their condition. This personalized approach improves patient engagement and enhances their ability to understand the risks, benefits, and post-operative care requirements associated with their surgery. Designed with accessibility in mind, the platform features a responsive interface that allows patients to access information on various devices, including desktops, tablets, and smartphones. This ensures convenience and ease of use, enabling patients to review details at their own pace. Additionally, the platform adheres to strict HIPAA compliance regulations, safeguarding patient data and maintaining privacy. This research highlights the platform’s role as an effective communication tool that strengthens the relationship between healthcare providers and patients. By improving understanding and transparency in medical procedures, the platform contributes to better-informed medical decisions and ultimately leads to improved patient outcomes and overall healthcare experiences.

#### **450. A ROBUST NATURAL LANGUAGE PROCESSING – DRIVEN CHATBOT USING TENSORFLOW FOR INTELLIGENT CONVERSATIONS**

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Natural Language Processing (NLP) has advanced the capabilities of artificial intelligence in human-computer interaction. This paper presents a detailed analysis and implementation of an NLP-based chatbot system. Integrating Speech-to-Text (STT), Natural Language Understanding (NLU), and Text-

to-Speech (TTS) modules, the chatbot achieves a high level of efficiency, adaptability, and multilingual support. We address previous drawbacks such as poor contextual understanding, limited scalability, and inability to handle ambiguous user queries. The proposed system uses state-of-the-art models like BERT, GPT-3, Wav2Vec, and Tacotron 2. Detailed step-by-step explanations, use cases, performance metrics, and future enhancement directions are provided.

#### **451. AUTOMATED UBUNTU SERVER HARDENING: A FRAMEWORK FOR ACHIEVING ENTERPRISE-GRADE SECURITY COMPLIANCE**

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In an era of escalating cyber threats, securing server infrastructures against vulnerabilities and misconfigurations remains a critical challenge. This paper presents Hardening Framework, an open-source, automated solution for enforcing enterprise-grade security compliance on Ubuntu servers. The framework addresses the limitations of manual hardening processes by providing a script-driven toolkit that systematically applies 200+ security controls aligned with CIS (Center for Internet Security) benchmarks, STIG (Security Technical Implementation Guides), and GDPR principles. Key innovations include the integration of intrusion detection (PSAD), filesystem integrity monitoring (AIDE), and USB device control (USBGuard) into a unified hardening workflow, alongside reproducible testing via Vagrant to validate configurations across environments. By automating kernel-level protections (e.g., disabling high-risk modules like DCCP and USB storage), enforcing systemd resource constraints, and deploying FIPS-compliant cryptographic policies for SSH, the framework reduces attack surfaces by 40% in benchmark tests. Compliance is further ensured through 760+ Bats test cases and SLSA Level 1 artifact verification, achieving 98% alignment with CIS Ubuntu 20.04 LTS guidelines. The modular architecture allows customization for cloud and on-premises deployments, while Vagrant-driven provisioning ensures consistency. This work demonstrates that automated, auditable hardening can bridge the gap between compliance standards and operational security, offering organizations a scalable blueprint for mitigating risks in Ubuntu server ecosystems.

#### **452. SPEECH RECOGNITION AND TRANSLATION USING MACHINE LEARNING**

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Societies developed in parallel with human technical progress, which resulted in the formation of several languages as a communication tool. These developments also make communication difficult because each culture had its own language. We have almost achieved state-of-the-art (excellent) results after testing almost every language translation method. Using JQuery to send a GET or POST request and translate the data, we have created a server-side machine translation technique (using machine learning for translation) that helps users translate. Three steps can be taken to achieve this: Speech recognition, or the ability to translate spoken words into text Machine learning for translation Speech synthesis is the process of turning translated text into sounds.

#### **453. ADVANCED HUMAN STRESS LEVEL-BASED ACCIDENT PREVENTION**

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An innovative real-time human stress detection system for preventing auto accidents is presented in this research. Using machine learning approaches, the system combines physiological signal monitoring, facial recognition, and emotion analysis. A pre-trained Convolutional Neural Network (CNN) is used to estimate stress, while OpenCV's Haar cascade is used for facial detection. To classify emotions, the k- Nearest Neighbors (KNN) algorithm is used. PPG and MAX30100 sensors are used to detect physiological signals, such as heart rate and SpO2, which are then processed by a NodeMCU microcontroller. Safer driving is ensured by the observed stress levels controlling vehicle speed. By recording both physiological and emotional indicators, this multi-modal technique greatly improves stress level evaluations and may be used for mental health monitoring and vehicle automation.

#### **454. LEVERAGING AI AGENTS FOR EFFICIENT AND AUTOMATED SOCIAL MEDIA MANAGEMENT**

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Social media has merged into one of the most important channels through which communication, marketing, and even branding can take place. The new-age social media management with AI is innovatively advancing business and personal participation within the public forum. AI-made social media management tools cleanse and automate redundancy, further people's interaction, and enable data-based observation, rendering social media activities more productive and target rendering. Chatbots run on AI and virtual assistants for customer interaction purposes in real time. They enable



the user experience and feedback. The mood of the audience is analyzed and addressed accordingly through sentiment analysis enabled by Natural Language Processing (NLP). Content generation, caption generation, hashtags, and sponsored posts are based on trending topics and user choices through AI. Publishing and posting types at the right time to increase engagement are handled through machine learning algorithms. Apart from handling the content, AI analytics also give specifics concerning audience interaction, campaign effectiveness, and competition. AI may be adopted for support in content moderation, detection of misinformation, hate speech, and deep fakes for platform integrity. Data privacy, misinformation, and the absence of human touch are burning issues that must be addressed. This article describes how AI is influencing social media management in terms of benefits, applications, and limitations. New as it is, AI will continue to change the future of digital marketing, and intelligent, efficient, and effective would be the new terms in social media management.

#### **455. BLOCKCHAIN-ENABLED MOBILITY SOLUTIONS DECENTRALIZED RENTAL CAR AND BIKE BOOKING SYSTEM.**

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The "Blockchain-Enabled Mobility Solutions: Decentralized Rental Car and Bike Booking System" is designed to revolutionize the traditional vehicle rental process by integrating blockchain technology to provide a secure, transparent, and efficient solution for booking rental cars and bikes. This decentralized platform allows users to rent vehicles directly from owners without intermediaries, ensuring lower costs, greater privacy, and enhanced user control. The core idea is to eliminate reliance on centralized authorities by leveraging blockchain's inherent features of immutability, transparency, and decentralization. Users can access the platform to browse available vehicles, book rentals, and make payments securely using cryptocurrencies or traditional payment methods. Smart contracts, powered by blockchain, automate the rental process, ensuring that both vehicle owners and renters comply with the terms of the agreement, reducing the risk of disputes. The system records all transactions on the blockchain, providing an auditable and transparent history of bookings, payments, and vehicle availability. By utilizing blockchain, the platform ensures secure payment processing and guarantees the privacy of user data, making it a reliable and trustworthy alternative to traditional rental services. The decentralized nature of the platform removes geographical barriers, allowing users to rent vehicles from any location with ease. The project aims to provide an efficient, cost-effective, and transparent solution to the growing demand for vehicle rentals, promoting a seamless user experience while reducing operational costs and improving service quality.

#### **456. SECURE SHARING OF SENSITIVE DATA USING AES, CHACHA-20, ASCON FOR ADMINISTRATION**

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In today's digital era, the secure transmission and storage of sensitive data is a major challenge, especially within administrative environments handling confidential information. This paper presents a robust, multi-layered encryption framework that leverages the combined strengths of three advanced  
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cryptographic algorithms—AES (Advanced Encryption Standard), ChaCha-20, and Ascon—to ensure data confidentiality, integrity, and authenticity. The proposed system encrypts the data sequentially using AES, ChaCha-20, and Ascon, each offering distinct advantages in terms of speed, security, and resistance to cryptographic attacks. For secure access, a One-Time Password (OTP) mechanism is implemented, providing an additional authentication layer. During decryption, the process is reversed while verifying data integrity using the SHA-256 hashing algorithm. Performance evaluations demonstrate that the system efficiently secures data with minimal computational overhead while offering enhanced protection against unauthorized access. The architecture is highly suitable for cloud storage, financial systems, and governmental applications where security and control are paramount.

#### **457. ETHEREUM BLOCKCHAIN FOR A SECURE AND TAMPERPROOF IOHT DATA MANAGEMENT**

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The Internet of Medical Things (IoMT) has recently advanced significantly and has not only changed the practice of medical treatment, but transformed how we communicate data in smart healthcare systems. Nevertheless, contemporary intrusion detection (ID) systems used in conventional network security designs are unsophisticated in their efforts to identify a multitude of known and emergent cyber threats including malware, ransomware, phishing attacks, and zero-day exploits. This is attributable primarily to their reliance on classical machine learning models that lack intense feature selection methods and classification reliability which yield high false positive rates and low precision rates for detection. To improve the extent and rigor of cyber threat detection and response, we propose an Intrusion Detection System (IDS) that leverages tree-based machine learning classifiers and a deep metric learning algorithm with filter-based feature selection methods to generate better accuracy, precision, and resilience from threats. The proposed IDS will help to monitor for threats in real-time, detect anomalies, and identify unauthorized or malicious behavior across interoperative medical devices and healthcare systems, which improves the overall cybersecurity context. To improve performance and reduce computational load, Mutual Information (MI) and XGBoost will be implemented as filter-based feature selection methods to ensure efficient data pre-processing and to capture the best features for effective cyber threat identification

#### **458. CMOS DESIGN FOR RESTORING DIGITAL SIGNAL IN PASS TRANSISTOR LOGIC**

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In designing digital circuit, threshold voltage drops in NMOS pass transistor actually leads to a great signal degradation, especially for the transmission of strong logic high signals. This loss of voltage commonly represented as can negatively impact circuit performance and signal integrity. To mitigate this limitation, a new methodology is introduced that makes use of a PMOS pass transistor with a feedback loop consisting of a CMOS inverter. The PMOS transistor acts as a level restorer and pushes the output voltage to the full  $V_{dd}$  level, compensating for the voltage loss that NMOS based circuits would be incurred.

A comparative analysis is being done by using LTspice to compare the performance of the conventional NMOS pass transistor with the proposed technique. Signal degradation and propagation delay are the

main focus in this analysis. The performance of this technique was validated through LTspice simulations, which showed significant improvement in signal restoration and transmission efficiency. While the proposed technique increases the circuit complexity and the number of transistors and hence increasing the area footprint, it effectively enhances the signal integrity and reduces the propagation delay. These advantages make it a reliable solution for high-performance digital applications where maintaining signal quality is essential.

#### **459. ENHANCING MELANOMA DETECTION WITH A HYBRID QUANTUM-CLASSICAL NEURAL NETWORK MODEL**

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This paper proposes a hybrid quantum-classical framework for melanoma diagnosis that integrates convolutional neural networks with quantum computing methods. The architecture has CNN layers to extract features from dermatological images and a 6-qubit quantum circuit employing Penny Lane for better decision-making. Input images are resized to 32×32 pixels, normalized to the range [-1, 1], and augmented for better generalization. The quantum part uses Angle Embedding to represent classical data as quantum states and Strongly Entangling Layers for representing features. Optimized with Adam optimizer for more than 15 epochs, the model exhibits robust performance in separating melanoma from non-melanoma lesions, as seen through high accuracy measures and ROC curve analysis. Although confusion matrix visualization validates overall performance, certain false negatives point to improvement opportunities. This research illustrates the potential of quantum computing for improving the detection of early skin cancer while determining challenges for future studies.

#### **460. FAKE JOB PREDICTION USING STACKED ENSEMBLE MODELS IN MACHINE LEARNING**

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The proliferation of online job recruitment platforms has brought unprecedented convenience to job seekers and employers. However, this convenience comes with a downside - the rise of fake job postings, which not only waste job seekers' time but also pose financial risks. To address this challenge, our project focuses on developing a fake job prediction system using machine learning techniques. Unlike previous versions, our system utilizes Streamlit, a Python library for building user interfaces, as the primary framework for the frontend. Users interact with the application directly through Streamlit, providing job postings for analysis. The core of our system lies in a trained machine learning model, which is saved as a pickle file. This model processes the user-inputted job postings and provides predictions on their legitimacy. The project's workflow involves user input, processing through the trained model, and outputting the predictions back to the user interface. Through meticulous analysis of various features extracted from job postings, our model aims to deliver accurate predictions in real-time, thereby empowering job seekers to make informed decisions and safeguard the credibility of online recruitment platforms. This abstract provides an overview of our project's objectives, methodology, and outcomes. Through the integration of Streamlit and a trained machine learning model,

we aim to provide a user- friendly and efficient solution for detecting fake job postings, ultimately contributing to a safer and more trustworthy online job market.

#### **461. RECOGNITION RNN-BASED HEARTBEAT SOUND ANALYSIS WITH DJANGO INTEGRATION**

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This project presents an innovative approach to heartbeat audio classification using Recurrent Neural Networks (RNNs) integrated with the Django framework. The primary aim is to develop an efficient and accurate system for classifying heartbeat sounds to aid in the early detection and diagnosis of cardiac conditions. The system leverages RNNs, which are particularly suited for processing sequential data, to analyze and classify heartbeat audio recordings. The Django framework facilitates seamless integration, providing a robust and scalable web application for data management, model deployment, prediction. The RNN model is trained on a diverse dataset of heartbeat audio recordings, enabling it to recognize various cardiac anomalies. The proposed system demonstrates high accuracy and reliability, making it a valuable tool for healthcare professionals. Additionally, the integration with Django ensures that the system can be easily accessed and utilized in clinical settings, promoting widespread adoption and improving patient outcomes.

#### **462. ASSESSING THE IMPACT OF THE HOMOTOPY PERTURBATION METHOD ON COMPUTATIONAL PERFORMANCE IN AI SYSTEMS**

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In this study, we evaluated the performance of the Homotopy Perturbation Method (HPM) in different AI application domains through three core metrics: Precision, Efficiency and Accuracy. The eight AI domains surveyed were as follows: Deep Learning; Reinforcement Learning; Fuzzy Logic AI; Computer Vision; Autonomous Systems; Predictive Analytics; Medical AI; and Optimization Problems. HPM overall performance is constantly higher for Medical AI and Autonomous Systems, and HPM outperforms on precision and accuracy, confirming the robustness because of its insertion in almost complex, sensitive environments. The balanced outcomes produced by Fuzzy Logic AI and Predictive Analytics further correlate with HPM's ability to deal effectively with uncertain or data-driven models. On the other hand, high performance on Reinforcement Learning and Optimization

Problems suggests areas where the rich landscape of HPM might need to be modified or combined with additional computational methods. In general, the results indicate that HPM is a potentially powerful semi-analytical approach for improving the computational efficiency and reliability of several significant AI tasks.

#### **463. AI-POWERED HEALTHCARE MANAGEMENT SYSTEM**

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The integration of Artificial Intelligence (AI) into healthcare is transforming service delivery and accessibility. This project, "AI Powered - Healthcare Management System," aims to revolutionize healthcare appointments by developing a digital platform for efficient booking and management. The system uses AI models, including LLAMA-3.2-Vision, Natural Language Processing (NLP), and Generative AI, to enhance patient care, streamline operations, and ensure data security. This system seeks to address inefficiencies in current healthcare by providing an intuitive experience for patients and providers. It enhances accessibility, optimizes workflows, and improves the quality of care. The system provides a comprehensive solution for patient registration, consultation, report generation, and appointment booking. NLP-powered voice input gathers patient data, which is stored in Electronic Medical Records (EMR). Generative AI creates detailed medical reports from diagnostic scans, and AI analyzes patient data to match them with suitable doctors. A patient portal offers secure access to medical records. The system uses AI to improve diagnostics, treatment, and patient outcomes. NLP enables efficient data entry, Generative AI aids in medical report generation, and AI algorithms support appointment booking and data analysis. The project automates processes, provides insights, and enhances patient engagement. Security measures are implemented to protect patient data. The system uses technologies like AI models, NLP, EMR, IoT, and cloud computing. AI enhances diagnostic accuracy, personalizes treatment, optimizes scheduling, predicts outbreaks, and improves patient engagement. Challenges include data protection, interoperability, technology adoption, regulatory compliance, costs, data accuracy, and ethical considerations.

#### **464. MICROSTRIP PATCH ANTENNA DESIGN FOR UNMANNED AERIAL VEHICLE IN 5G COMMUNICATION NETWORKS**

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The use of Unmanned Aerial Vehicles (UAVs) has gained significant momentum in recent years due to their flexibility, mobility, and capability to support a wide range of applications, particularly in wireless communication. With the emergence of 5G networks, integrating compact and efficient antenna systems into UAVs has become crucial to enable high- speed, low-latency communication. Among various antenna types, Microstrip Patch Antennas (MPAs) are highly preferred in UAV applications because of their low profile, lightweight structure, ease of fabrication, and compatibility with planar and conformal surfaces. In this paper, a 4×4 microstrip patch antenna array is designed at 28 GHz specifically for UAV-based 5G communication systems. The antenna utilizes a Taconic TLY-5A substrate, selected for its low dielectric loss and suitability for millimeter-wave frequencies. A right-

shifted line feed technique is implemented and a stub is introduced near the port end of the main feed line to enhance bandwidth and impedance matching performance. The proposed design achieves a wider bandwidth of 2.2 GHz with a gain of 17.4db and a return loss of -35 dB across the operating frequency range. The compact and efficient nature of this design makes it well-suited for integration into UAV platforms, supporting reliable and high-performance 5G communication and the antenna. The proposed antenna design was modeled and simulated using CST Microwave Studio.

#### **465. AUTOMATIC EVALUATION OF DESCRIPTIVE ANSWERS**

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This paper highlights NLP techniques used to evaluate Descriptive Answers Here we used various NLP Techniques for Text Preprocessing and for SimilarityAnalysis Keywords Extraction, Summarization, Modeling on Topics, OCR recognition. Few other techniques will be Tokenization with Preprocessing, Semantic Similarity, Grammar Check, verifying Concept coverageThis paper gives more information on evaluation of descriptive answers to ensure the validation is done faster and accurately. This will not only save more time for the evaluators but also helps them to understand the focus areas of the students and take necessary steps in an measurable and efficient way. This will not only boost the timeline for both students and teachers but also help to stay synchronized and being up-to date, all time. We will be using various NLP Techniques to achieve our goals for better solutioning. This will ensure we move on to the next level of smooth evaluation in short span of time.

#### **466. DESIGN OF COMPACT MULTIBAND MICROSTRIP PATCH ANTENNA WITH PARTIAL GROUND PLANE FOR 5G APPLICATIONS**

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A compact multiband microstrip patch antenna with a partial ground plane is tailored for fifth-generation (5G) wire less communication in the millimeter-wave (mm-wave) spectrum. The antenna is modeled and analyzed using CST Microwave Studio and fabricated on a Rogers RT5880 substrate ( $\epsilon_r = 2.2$ ), known for its low loss characteristics. With compact dimensions of  $24 \times 24 \times 0.203 \text{ mm}^2$ , the antenna operates effectively across two wide frequency bands: 25–32 GHz and 40–60 GHz, which are key for 5G applications. Simulation results demonstrate a maximum gain of 10.6 dBi and in the 25-32GHz band, and 11.06 dBi in the 40-60GHz band. The use of a partial ground plane contributes to improved Gain, impedance matching and wider bandwidth. The proposed design makes it a strong candidate for compact and high-performance antenna solutions in next generation 5G applications. such as ground plane modification, slotting, and defected ground structures (DGS) to improve performance [4][5]. These methods help in achieving wide bandwidth, multiband operation, and improved impedance matching.

#### **467. AN AI-POWERED PETITION ANALYSIS AND GRIEVANCE TRACKING SYSTEM FOR GOVERNMENT AGENCIES**

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This paper describes a comprehensive system that automates the end-to-end lifecycle of public petition management. Four AI modules—department classification, urgency detection, auto-rejection of invalid submissions, and repetition detection—process incoming grievances; a rule-based engine enforces response (3-day) and resolution (30-day) deadlines through reminders and escalations. The backend uses Node.js and MongoDB, while AI services are hosted on FastAPI with GPU support. Trained on 1 500 synthetic petitions (300 per department), our DistilBERT classifiers achieved 93.2% accuracy for department assignment, 90.1% F1 for urgency flagging, and 94.0% precision/92.5% recall for auto-rejection; a Sentence-BERT repetition detector yielded 0.89 ROC-AUC. A React-based web portal alongside SMS notifications delivers role-based queues and status updates. Future work includes district-level analytics with GIS-driven heat maps and enhanced UI accessibility for differently-abled users.

#### **468. MULTI-MODAL DEEPPAKE DETECTION OF IMAGES, VIDEOS, AND AUDIO USING AI/ML TECHNIQUES**

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With the rise of the digital age, the increased use of deepfake media—synthetic changed photographs, videos, and audio—is threatening information authenticity, privacy of individuals, and public trust. In this study, we propose a multi-modal deepfake detection framework that utilizes machine learning and deep learning techniques to identify manipulated content across three primary domains—images, videos, and audio. The input files are uploaded in the authenticated website. In this model, the deepfake or morphed files will be detected using multiple AI/ML algorithms, for instance, Convolutional Neural Network (CNN) for Images, additionally Long Short-Term Memory (LSTM) for Videos and Mel-Frequency Cepstral Coefficients (MFCC) & Deep Neural Network (DNN) or LSTM for Audios, finally Generative Adversarial Networks (GANs) on the whole. The output display includes detecting whether the input file is morphed or not, its confidence percentage, detecting the regions/ frames/ segments which are morphed by stating the coordinates of the image/ video/ audio file respectively. The deepfake detection analysis is performed based the factors like differentiation in lightings, skin colour, colour grading, impossible scenarios for the images, additionally facial expressions & body languages mismatch with the context, frame inconsistencies for the videos, finally anomaly in the voice, tone, content, context and speech patterns of the segments of the audio.

#### **469. ENHANCING AI-DRIVEN REAL-TIME SPEECH- TO-SIGN LANGUAGE SYSTEM FOR INCLUSIVE COMMUNICATION IN PUBLIC EVENTS**

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This project aims to develop an AI-enabled system that converts spoken language into sign language in real-time using animated avatars. Designed to assist individuals with hearing and speech impairments, the system ensures seamless communication during public events, eliminating the need for human interpreters. The solution integrates three key components: a Speech Recognition Module to convert speech to text, a Natural Language Processing (NLP) Module to map text to corresponding sign language gestures, and an Animation Rendering Module to display gestures through an animated avatar. By leveraging tools like speech-to-text APIs, NLP frameworks, and 3D animation software (e.g., Unity or Blender), the system processes speech inputs, identifies appropriate sign language gestures, and renders them in real-time. This innovative approach promotes inclusivity and accessibility, enhancing communication for differently-abled individuals.

#### **470. WEARABLE SOLUTION FOR REAL-TIME POSTURAL MONITORING AND BIO-FEEDBACK IN LOWER LIMB AMPUTEES**

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Rehabilitation for lower limb amputees goes beyond physical healing—it requires patients to relearn balance, coordination, and posture control to adapt effectively to prosthetics. Poor posture during this crucial stage can hinder progress and lead to inefficient gait patterns or long-term complications. Our proposed system introduces a simple, wearable bio-feedback solution designed to help users monitor and improve their posture independently. In contrast to existing solutions that rely on complex machine learning algorithms or expensive multi-sensor setups, our approach emphasizes accessibility, comfort, and ease of use. The system uses two ADXL345 accelerometer sensors, placed on the shoulder and ankle, to track angular deviations during walking. When a deviation is detected, a buzzer delivers immediate auditory feedback, encouraging timely correction. Early user feedback highlights the system's comfort and effectiveness in increasing posture awareness. By supporting self-guided rehabilitation, our solution promotes motor learning, builds user confidence, and enhances overall recovery outcomes for amputee patients.

#### **471. LAND COVER CLASSIFICATION AND RECONSTRUCTION OF DIMA HASAO DISTRICT USING MULTISPECTRAL DATA AND ADA WITH RANDOM FOREST**

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Multispectral imagery plays a critical role in forest classification and environmental monitoring, yet high-resolution images present significant challenges in both classification accuracy and subsequent image reconstruction. Traditional approaches, such as Support Vector Machines (SVM) and Random Forest classifiers, often rely on pixel-wise classification, which can lead to fragmented outputs when applied to high-resolution data. To overcome these limitations, we propose an advanced framework that integrates AdaBoost with Random Forest for the classification of bamboo forests, utilizing PlanetLabs multispectral data from the Dima hasao district of Assam. Our method leverages the Normalized  
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Difference Vegetation Index (NDVI), Bamboo Index (BI) to classify image chunks into four distinct categories—Forest, Fallow, Barren, and Bamboo. This classification is followed by the reconstruction of the classified chunks into a coherent, spatially consistent image. The inclusion of image reconstruction not only enhances the visual appeal of the output but also ensures greater spatial integrity, making our framework a superior tool for forest management and ecological studies compared to existing methods.

#### **472. HEART DISEASE PREDICTION USING MACHINE LEARNING**

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Heart disease remains the leading cause of global mortality, necessitating advanced predictive models for early detection. This research leverages machine learning algorithms to improve heart disease risk prediction. Various models, including Logistic Regression, Naïve Bayes, Support Vector Machines (SVM), K-Nearest Neighbors (KNN), Decision Trees, Random Forest, XGBoost, and Artificial Neural Networks (ANN), were evaluated using a dataset from the UCI Machine Learning Repository. The proposed model, based on Random Forest, achieved a remarkable accuracy of 95%, demonstrating its effectiveness in cardiovascular risk assessment. This study underscores the transformative potential of machine learning in predictive healthcare and its role in proactive medical decision-making.

#### **473. ENHANCING PRIVACY AND SECURITY IN CLOUD-BASED PERSONAL HEALTH RECORD SHARING THROUGH SeSPHR METHODOLOGY.**

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The broad acknowledgment of cloud-based administrations in the healthcare sector has resulted in cost-effective and convenient exchange of Personal Health Records (PHRs) among several participating entities of the e-Health systems. Nevertheless, storing confidential health information on cloud servers is vulnerable to disclosure or theft and requires the development of methodologies that ensure the privacy of the PHRs. Accordingly, we propose a system called SeSPHR for secure sharing of the PHRs in the cloud. The SeSPHR scheme ensures patient-driven control over the PHRs and preserves the confidentiality of the PHRs. Patients store the encrypted PHRs on untrusted cloud servers and selectively grant access to different types of users for different portions of the PHRs. A semi-trusted proxy called the Setup and Re-encryption Server (SRS) is introduced to set up the public/private key pairs and to generate the re-encryption keys. Moreover, the method is secure against insider threats and also enforces forward and backward access control. Furthermore, we formally analyze and verify the operation of the SeSPHR methodology through High-Level Petri Nets (HLPN). Performance evaluation

with respect to time consumption shows that the SeSPHR approach has the potential to be used for securely sharing the PHRs in the cloud.

#### **474. MENTAL HEALTH CHATBOT USING NATURAL LANGUAGE PROCESSING**

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The increasing importance of mental healthcare within the broader healthcare landscape is evident. An AI-driven system addresses user queries with immediate, context-aware responses, delivering real-time support. Through advanced NLP processes (tokenization, semantic similarity, and WordNet synonym identification), the chatbot understands user issues with great empathy and relevance. The architecture of the system includes a closed-loop feedback system for ongoing tuning, permitting administrators and/or mental health practitioners to update the knowledge base as necessary. Vary the sentence structure. Use synonyms for key phrases. Rephrase to emphasize the active role of the chatbot and the impact of its features.

#### **475. X-RANSM: A SMOTE-ENHANCED STACKING ENSEMBLE MODEL FOR CREDIT-CARD-FRAUD DETECTION**

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Credit-Card-Fraud continues to be an ongoing and ever-changing threat to the financial sector, further fueled by the increase in online transactions and ever-changing fraud schemes. Traditional approaches that are either rule-based or individual machine learning based approaches may not be effective in detecting fraud due to continually evolving patterns and imbalanced datasets where legitimate transactions greatly exceed fraudulent transactions. In order to overcome the aforementioned challenges, this research offers the X-RANSM, a hybrid stacking ensemble framework to improve fraud detection accuracy and robustness. Using SMOTE (Synthetic-Minority-Over-sampling-Technique) to offset any class imbalance and merge the base learners with a meta-classifier to maximize final predictions, the proposed framework combines a stacked architecture of Random-Forest, XG-Boost, and Artificial-Neural-Network (ANN) as base learners. A publicly available Credit-Card-Transaction dataset trains and tests the system, revealing that just 0.172% of observations induce fraudulent behavior. X-RANSM outperforms baseline samples produced by conventional models in terms of evaluation measures such as Precision-Score, Recall-Score, F1-Score, and AUC-ROC across every sample size category. The X-RANSM offers a scalable and flexible mechanism for real-world credit card fraud detection that better fits to generalization across the uneven distribution of credit card transactions by using both data augmentation and multi-model learning.

#### **476. A BENCHMARK COMPARISON OF SIMPLE CNN, RESNET-50, AND EFFICIENTNET FOR IMAGE CLASSIFICATION**

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Terrain Type Identification is an essential aspect of environmental monitoring, urban planning, and resource management. This study discusses a comparative investigation of the effectiveness of three Convolutional Neural Network (CNN) architectures—Simple CNN, ResNet-50, and the Enhanced Efficient CNN Model: EfficientNet—in training with the EuroSAT dataset of 27,000 geo-referenced Sentinel-2 satellite images in ten land cover classes. This paper also examines the impact of preprocessing techniques—including image resizing, data augmentation, and normalization—on enhancing the overall performance of the models. The effectiveness of each model was carefully evaluated by looking at how accurately and consistently they recognized different land cover types, ensuring balanced performance across all classes. Experimental results indicate that the Enhanced Efficient CNN Model: EfficientNet has the highest classification accuracy of 97.5%, followed by Simple CNN with the accuracy of 94% and ResNet-50 with the accuracy of 89%. Furthermore, maintaining RGB features using simple resizing performs better than grayscale conversion. Findings of the study highlight the significance of choosing appropriate model structures and preprocessing techniques for effective Terrain Type Identification from remote sensing imagery, leading to the formulation of effective deep learning models for remote sensing.

#### **477. DESIGN OF TWO PORT WIDEBAND MIMO FILTENNA FOR WIRELESS APPLICATIONS**

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A considerable number of antennas are required in modern wireless devices to allow them to be used for numerous communication services. This not only makes the system larger but it also increases power loss. Filtenna (filter, antenna) replaces them resulting in a system with a reduced profile, less weight, and higher efficiency. The objective of this work is to design and evaluate the defected ground based dual port MIMO filtenna, also known as a MIMO filtering antenna constructed by combining a filter and an antenna. The first step of the design involves the design of wideband radiator and in the second step filter is embedded into the wideband to select only the desired frequency of interest in the operating band while rejecting the other signals. The CST microwave studio simulation tool will be used to create and model the filtenna. For the proposed design, many parameters like return loss, isolation, surface currents, realised gain, and radiation patterns will be evaluated for achieving better and optimised results. MIMO performance metrics, including the ECC, diversity gain will also be evaluated for better study of diversity performance making it suitable for use in wireless applications.

#### **478. CANCER DETECTION USING MACHINE LEARNING**

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Cancer remains a major global health challenge, causing millions of deaths annually. Early detection of cancer significantly improves treatment outcomes and survival rates. Traditional diagnostic techniques such as imaging and biopsies often fail to identify cancer at an early stage. This research presents a machine learningbased predictive model capable of assessing cancer risk with high accuracy. Various supervised learning algorithms, including Random Forest, Support Vector Machines, k-Nearest Neighbors, and Naïve bayed, are implemented to analyze patient datasets. The proposed system leverages feature engineering, data preprocessing techniques, and statistical evaluation metrics such as accuracy, precision, recall, and F1-score. The study aims to provide ealthcare professionals with a reliable, efficient, and scalable tool for early-stage cancer detection, facilitating timely medical intervention.

#### **479. INFO HUB**

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This paper outlines the end-to-end development of Info Hub, an IoT-driven smart information display system aimed at enhancing real-time communication in modern environments. The project begins with identifying the need for a dynamic and user-friendly platform capable of delivering instant updates across various locations such as schools, offices, and public facilities. The system architecture integrates a cloud-based backend using Google Firebase with a hardware front end consisting of the ESP8266 Wi-Fi module and an LCD screen for content display. A custom mobile application, built using MIT App Inventor, allows users to input and transmit messages remotely. These messages are instantly synchronized through Firebase, enabling live updates on the display module via wireless connectivity. The implementation emphasizes ease of use, cost-efficiency, and minimal infrastructure requirements. Testing and evaluation were conducted to assess system performance in terms of data transmission speed, display accuracy, connectivity stability, and user interaction. Results indicate that Info Hub performs reliably with minimal latency and provides a scalable solution for real-time information dissemination. The project concludes with an analysis of its practical applications and potential enhancements for future versions, including multi-display support and integration with additional IoT sensors. Overall, Info Hub presents a practical and adaptable system that contributes to the evolution of smart environments through seamless information delivery.

#### **480. INTEGRATING CELLULAR AUTOMATA AND ARTIFICIAL NEURAL NETWORKS FOR LAND USE LAND COVER CHANGE DETECTION: A CASE STUDY OF MANGALORE, INDIA**

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Urbanization is the process of growth of cities due to large proportions of the population shifting out of rural areas. This shift is attributed to better employment opportunities, availability of transportation, and more favorable living conditions among several others. While urbanization is key to economic development, it comes with major downsides like loss of biodiversity, pollution, land degradation, congestion, and reduction of water bodies. Over the years, the pattern of urbanization has become more haphazard, leading to over-utilization of resources. It is necessary to negate the downsides of urbanization and assist in developing sustainable cities ensuring residents' health and well-being. Evident victims of this kind of urbanization include Tier 2 cities of India, which are sites of rapid development. Mangalore, a Tier 2 city in Karnataka, India, serves as a striking example. It has witnessed high rates of development owing to its status as the only city in Karnataka to have all four modes of transport—air, road, rail, and sea. This study utilizes the Cellular Automata Markov Model and Artificial Neural Network-based predictive modeling on Land Use Land Cover maps to understand and predict Mangalore's future urban growth patterns.

#### **481. A WARRANT BASED SECURE DATA SHARING USING MEDIATOR RE-ENCRYPTION IN INTERNET OF MEDICAL THINGS**

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The Internet of Medical Things (IoMT) has revolutionized healthcare by allowing actual-time monitoring, seamless connectivity, and green information trade among scientific gadgets and stakeholders. However, the sensitive nature of scientific information demands robust protection mechanisms to make certain privateness, confidentiality, and managed access. This paper proposes a warrant-based totally steady records- sharing framework the use of mediator re-encryption for the IoMT environment. The framework employs a warrant mechanism to authorize records get right of entry to, ensuring that only valid entities with valid credentials can get entry to the encrypted statistics. A proxy re-

encryption(PRE) scheme is utilized, permitting a trusted mediator to re-encrypt records for legal customers without exposing the original plaintext or private keys. The proposed machine gives quality-grained get entry to manipulate, allowing dynamic and scalable information-sharing policies that adapt to varying healthcare desires. By integrating lightweight cryptographic strategies, the framework addresses the resource constraints of IoMT gadgets whilst preserving data protection and integrity.

#### **482. EV CHARGING MANAGEMENT AND BATTERY MONITORING SYSTEM BASED ON INTERNET OF THINGS: A REVIEW**

Tripti Kun  
Kirti Pal

With the increasing adoption of electric vehicles (EVs) and the growing demand for efficient and sustainable transportation, the management of EV charging infrastructure and battery monitoring has become crucial. This review paper aims to provide an overview of the state-of-the-art techniques and technologies in EV charging management and battery monitoring, highlighting their importance in optimizing charging efficiency, enhancing battery performance, and ensuring reliable operation. The

first part of the review focuses on EV charging management, encompassing various aspects such as charging station deployment, charging protocols, and scheduling algorithms. The paper discusses different charging infrastructure designs, including public, private, and wireless charging stations, and examines the benefits and challenges associated with each. The second part of the review addresses battery monitoring techniques for EVs, aiming to ensure the longevity and reliability of energy storage systems. It presents an overview of battery chemistries commonly used in EVs, including lithium-ion (Li-ion) batteries, and discusses the importance of monitoring battery health parameters such as state of charge (SOC), state of health (SOH), and temperature. The paper highlights the significance of battery management systems (BMS) in monitoring and controlling battery operation, including voltage regulation, cell balancing, and thermal management. Furthermore, it explores advanced techniques like machine learning and data analytics for predictive battery diagnostics and prognostics, enabling early detection of faults and degradation.

The review concludes by summarizing the key findings and identifying potential research directions and challenges in the field of EV charging management and battery monitoring. The insights provided in this review paper can serve as a valuable resource for researchers, industry professionals, and policymakers involved in the development and deployment of EV charging infrastructure and battery technologies, contributing to the advancement of sustainable transportation.

#### **483. REALTIME AIR POLLUTION MONITORING AND ANALYSIS USING IOT**

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Air quality is essential for sustaining public health and environmental equilibrium. Air pollution due to pollutants such as carbon monoxide and smoke may result in critical respiratory illnesses and environmental deterioration. Industrialization and urbanization have contributed extensively to the increase in air pollution, and therefore, real-time monitoring is required. Conventional methods of monitoring tend to lack responsiveness, coverage, efficiency and scalability. To overcome these limitations, integration of Internet of Things (IoT) and Artificial Intelligence (AI) technologies has come up as a robust solution for monitoring air quality. IoT-based sensors pick up real-time information regarding environmental parameters like temperature, humidity, carbon monoxide, and smoke levels persistently. An ESP8226 module sends this information to the Blynk platform, thereby making it available via mobile app. This information is sent to an AI-powered system via USB to UART converter, where a Machine Learning model, specifically based on the Decision Tree algorithm, processes the input to determine air quality as "normal" or "abnormal". The system not only identifies existing air quality levels but also studies past data to determine patterns and forecast future pollution levels. When values go beyond set safety limits, the system automatically raises alarms and sends emails to concerned authorities and parties. This real-time alert system allows for prompt action to reduce potential hazards. Through the integration of IoT, AI, and automated communication, the system not only improves the capacity to monitor and respond to air pollution but also encourages proactive measures for better environmental management and air quality

#### **484. LIPSYNCDL: A DEEP LEARNING APPROACH TO SILENT SPEECH RECOGNITION**

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Silent-speech recognition focuses on interpreting lip movements and translating them into text without using acoustic signals. This study employed a deep learning-based method that utilizes convolutional and recurrent neural networks. A Conv3D architecture is used to extract spatial features from video frames, followed by bidirectional LSTM layers that model the temporal sequences. The dataset comprises video recordings of speakers along with their respective text annotations, which are processed using TensorFlow pipelines. To prepare the data for training, frame extraction, grayscale conversion, and normalization were performed. The model was optimized with the Adam optimizer and trained using the Connectionist Temporal Classification (CTC) loss function to synchronize visual input with textual output. The assessment of test samples demonstrated the success of the method in identifying silent speech. The findings emphasize the possible use of this model in assistive communication tools, especially for those with speech difficulties. Future enhancements may involve increasing model precision and changing the system for instant use.

#### **485. IDENTITY BASED CONDITIONAL DISSEMINATION AND PRIVACY PRESERVING MULTI-OWNER DATA SHARING**

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Since cloud services are developing rapidly, enormous amounts of information are transmitted using cloud computing. Although there have been some cryptographic techniques utilized to provide data privacy in cloud computing, current schemes cannot force privacy problems on the ciphertext for the situation of having multiple owners, so co-owners can no longer properly regulate whether dissemination distributors are permitted to actually scatter their data. In this paper, we propose a secure data group sharing and conditional dissemination scheme with multi-owner for cloud computing, in which data owner can share private data with a user group via the cloud securely, and data disseminator can disseminate the information to a new user group when the attributes satisfy the access policies in the ciphertext. We also propose a multiparty access control framework over the distributed ciphertext, and the co-owners of the data can introduce new access policies to the ciphertext according to their privacy preference. Moreover, three policy combination schemes, i.e., full permit, owner priority and majority permit, are supported to resolve the privacy conflicts problem caused by diverse access policies. The conditional dissemination mechanism can ensure that only users who satisfy a given attribute condition are allowed to access shared data.

#### **486. TRACK ASSISTANT**

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Hill road accidents are an ongoing safety problem, caused by a variety of issues such as steep curves, poor visibility, sudden elevation changes, and unstable vehicle dynamics. Traditional static signboards are not always able to provide real-time information or adequate warnings, particularly in blind curve areas where drivers need to react promptly. To address this demand, the S-Track Assistant system has been created; it is an Internet of Things (IoT)-based vehicle detection and warning system, specially designed for hilly and rural roads. The system to be deployed comprises ultrasonic sensors strategically positioned at major bends and curves on the road. The sensors are interfaced with an ESP8266 microcontroller in the prototype, employing Wi-Fi technology to sense the presence of vehicles within specified danger zones. On detection, the system issues a visual warning through LED indicators and an overhead display board mounted in front of the curves. The warnings alert the drivers to reduce speed and exercise a greater level of caution, thereby significantly eradicating the occurrence of head-on collisions and run-off-road accidents. The first prototype uses Wi-Fi and ultrasonic sensors for proof of concept, but the solution envisioned for use in the real world uses radar sensors to provide increased detection range and accuracy. The system further features fog sensors to dynamically adjust the brightness and legibility of warning signs in low visibility conditions, e.g., heavy rain or fog. Instead of using Wi-Fi, which might represent a reliability or security concern if used in off-line locations, the ultimate system implementation uses RF modules to support reliable, secure, and off-line communications among devices. The S-Track Assistant is designed to work reliably even in remote areas with weak infrastructure, thus ensuring uninterrupted safety coverage. Its modular design allows it to scale, thus being deployable on various terrains with minimal reconfiguration. By giving timely, location-specific alerts to drivers, the system not only makes individual drivers more alert but also plays an important part in intelligent traffic control measures for hilly and accident zones.

#### **487. LIGHTFEDGUARD: AN EFFICIENT FEDERATED LEARNING FRAMEWORK FOR NON-IID AND ADVERSARIAL IIOT NETWORKS**

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Federated Learning (FL) offers a decentralized approach for securing Industrial Internet of Things (IIoT) systems, but its effectiveness is hindered by non-IID data distributions and malicious nodes that poison model updates. Existing solutions either assume IID data or introduce excessive computational overhead, making them impractical for resource-constrained IIoT environments. This paper proposes LightFedGuard, a lightweight FL framework that simultaneously addresses non-IID robustness and malicious node detection. Our framework introduces (1) adaptive clustering-based aggregation to mitigate data heterogeneity, (2) a low-complexity cosine similarity detector to identify adversarial updates, and (3) gradient sparsification to reduce communication costs. Evaluations on IIoT sensor data demonstrate that LightFedGuard achieves 90% accuracy (12% higher than FedAvg) under non-IID settings, reduces communication overhead by 30% compared to Byzantine-resistant baselines (e.g., Krum), and detects 92% of malicious nodes with minimal computational burden. The results highlight LightFedGuard's suitability for real-world IIoT deployments, balancing security, efficiency, and scalability. This work bridges critical gaps in FL for IIoT, offering a solution for resilient and resource-efficient federated learning.

#### **488. CHRONIC DISEASE MANAGEMENT THROUGH REMOTE PATIENT MONITORING AND TELEMEDICINE USING XGBOOST**

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This systematic review explores how predictive analytics supports Managing chronic diseases through early detection of disease progression, lowering hospitalization rates, and enhancing patient health outcomes. This review compiles insights from 35 peer-reviewed studies that utilized predictive models leveraging data from electronic health records (EHRs), wearable devices, and real-time monitoring systems to support the management of chronic illnesses such as diabetes and cardiovascular conditions. The analysis highlights that predictive analytics play a vital role in facilitating early diagnosis, notably excelling in anticipating heart failure exacerbations and decreasing hospital readmission rates through prompt clinical interventions. Moreover, many of the studies highlight a decrease in overall healthcare usage driven by early, data-informed actions. Despite these benefits, issues such as inconsistent data quality, challenges in system integration, and concerns around the reliability of models were commonly noted. Ethical considerations—such as patient privacy, data protection, and bias within algorithms—were also frequently addressed. Overall, the review emphasizes the increasing value of predictive analytics in healthcare, while recommending further improvements in data integration and ethical governance to fully realize its benefits.

#### **489. MOTION CAPTURE CAMERA FOR SECURITY**

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This project introduces a cost-effective motion capture system using Raspberry Pi, a microwave sensor, and a camera for real-time motion detection. When motion is detected, an image is captured and sent to a server via Wi-Fi, where it is stored in a database and displayed on a web interface for remote monitoring. Integrated AI-powered facial recognition allows users to customize settings, such as disabling image capture or putting the camera to sleep when a recognized person is detected. IoT technology enables real-time notifications and secure access, with API key authentication ensuring authorized interactions. The open-source nature reduces costs while offering scalability for additional devices. This system provides a secure, customizable, and affordable surveillance solution.

#### **490. PREDICTIVE MODELLING FOR NETWORK THREAT DETECTION**

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The advent of artificial intelligence (AI) has revolutionized network security by enabling predictive modelling for proactive threat detection. This paper proposes an innovative approach to enhancing network security through AI-driven predictive modelling. By analysing vast volumes of network traffic data, AI algorithms can detect patterns indicative of potential threats, including malware, intrusions, Prince Dr.K.Vasudevan college of Engineering and Technology, India  
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and anomalous activities. The predictive models developed through this framework can forecast vulnerabilities and detect emerging threats before they materialize into actual breaches. This proactive strategy empowers organizations to strengthen their network defenses, reduce the risk of cyberattacks, and protect sensitive information. In parallel, the global deployment of cellular IoT technologies—specifically LTE-M (LTE-Machine Type Communication) and NB-IoT (Narrowband Internet of Things)—to support large-scale services such as smart metering and environmental monitoring has introduced new security challenges. These IoT services operate within the existing cellular infrastructure alongside non-IoT services, such as smartphones. However, the integration of IoT into cellular networks can inadvertently introduce security vulnerabilities stemming from design flaws in communication standards, operational misconfigurations, and device-level implementation weaknesses. This research investigates the security vulnerabilities of cellular IoT systems from both system and service integration perspectives. We identify several critical issues, including the remote exposure of IP addresses and phone numbers of IoT devices, disruption of power-saving features, and the potential for adversaries to execute data/text spamming, battery-draining, and device-hibernation attacks. The envisioned AI-powered predictive modelling system serves as a comprehensive defence mechanism, combining advanced machine learning algorithms with real-time network traffic analysis. Through anomaly detection and deep learning techniques trained on historical cyber incident data, the system evolves to anticipate and counteract sophisticated threats. This integration not only improves threat detection accuracy but also significantly enhances response times, enabling security teams to deploy countermeasures rapidly. By proactively protecting network infrastructures, this approach ensures a robust cybersecurity posture and uninterrupted operational continuity across industries in today's highly connected digital landscape.

#### **491. SENTIMENT ANALYSIS ON INDIAN LANGUAGES**

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In the age of digital communication, sentiment analysis plays a crucial role in understanding public opinion, user behavior, and social trends. While significant progress has been made in analyzing sentiments in English and other global languages, there exists a considerable gap in effective sentiment analysis for Indian languages due to their linguistic diversity, lack of annotated datasets, and complex grammatical structures. This project, titled "Sentiment Analysis on Indian Languages," aims to bridge this gap by developing an AI-driven system capable of detecting and classifying sentiments expressed in multiple Indian languages such as Hindi, Tamil, Telugu, Bengali, and Kannada. The system leverages Natural Language Processing (NLP) techniques, multilingual embeddings, and transformer-based architectures like BERT and IndicBERT to preprocess, analyze, and interpret text data sourced from social media, reviews, and news platforms. Key challenges addressed include language code-switching, dialect variations, and syntactic ambiguities. The model is trained and fine-tuned using publicly available Indian language corpora, and its performance is evaluated using standard classification metrics like accuracy, precision, recall, and F1-score. This project not only promotes linguistic inclusivity in AI applications but also contributes to the broader goal of building sentiment-aware systems for India's multilingual population. The outcomes of this research have the potential to benefit businesses, policymakers, and social researchers in making data-driven decisions tailored to regional and cultural sentiments.

#### **492. SECURE CLOUD STORAGE WITH DUAL CUSTOM S-BOX ALGORITHM AND HMAC INTEGRITY VERIFICATION**

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The technological advancement has necessitated the need for more robust encryption techniques as cyber threats evolve. Security in cloud storage is still an issue, especially in the areas of data privacy and authentication. The proposed cloud-security model centered on a dual custom-S-box-hybrid-encryption strategy conjoined with HMAC-data-integrity-life assurance. The method of S-box generation occurring in random and per user falls on the side of friction against crypto-analysis and brings less shame. Further linking PBKDF2 to secure relations in the creation of private keys for each user puts brute-force attacks to a great test in which the strength of the process becomes entirely dependent on time and memory. For example, the system requires that all data should be hashed with SHA-256 to yield a strong level of assurance on the integrity of those data; meaning that any tampering with the stored files would always be detected on time. Structurally, the system is composed of three main watchdogs: The Data Owners secretly encrypt and upload data; the Data Users decrypt and gain access to believably trustworthy files; and finally, the Trusted Authority becomes active in the distribution of keys that certify any unique user. This advanced approach, as opposed to the common cloud storage protocol, argues that its properties of making claims regarding confidentiality and integrity can supercharge access policing amidst the ramping demands placed on scalable and flexible framework and feature policies inherent in cloud storage. The framework, in pairing up with a galaxy of technologies in these special fields of encryption and authentication, is in sharp contrast to beforehand existing methodologies, thus laying one more piece between them.

#### **493. EARLY DETECTION AND CLASSIFICATION OF BRAIN TUMOR USING RESNEXT**

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Brain tumors pose a significant threat to human life, necessitating prompt and accurate diagnosis for effective treatment. Early intervention improves patient outcomes, but manual diagnosis is time-consuming and prone to errors. This study proposes an automated method for early-stage brain tumor detection and classification using deep learning. The ResNeXt model, a state-of-the-art convolutional neural network, is employed to achieve high precision in analyzing MRI scans. Preprocessing steps, including image resizing, normalization, and augmentation, enhance the quality and diversity of the dataset, ensuring faster model learning and improved accuracy. The dataset is split into training and testing sets, enabling ResNeXt to learn and identify tumor types, such as glioma, meningioma, and pituitary tumors. The proposed method demonstrates a significant performance improvement over existing methods, with an accuracy increase of 15% and a reduction in false positives by 20%. When applied to new MRI data, the algorithm effectively classifies the tumor into the correct category. This automated approach minimizes diagnostic time and reduces human error, offering healthcare professionals a powerful tool to enhance diagnostic standards. By enabling earlier diagnosis, this method contributes to improved healthcare management and better patient outcomes for brain tumor cases.

#### **494. SWARA-NET: MACHINE LEARNING FRAMEWORK FOR RAGA RECOGNITION IN INDIAN CLASSICAL MUSIC**

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This paper presents a novel approach to raga classification and identification in Indian classical music using machine learning techniques. We propose a comprehensive system that leverages audio processing and deep learning methodologies to accurately identify and classify ragas based on their distinctive tonal and structural characteristics. Our approach extracts critical features including pitch histograms, tonal centroids, and spectral properties to capture the unique melodic patterns of five classical ragas: Shankarabharanam, Revathi, Abheri, Brindavanasaranga, and Mayamalavagowla. The system employs a neural network architecture optimized to recognize the essential swaras (notes) and their relationships within each raga, achieving 98% classification accuracy. Unlike traditional classification methods based on Thaat or Raag-Ragini systems, our approach focuses on the fundamental rules of raga composition, particularly the presence of Madhyam and Pan-cham swaras. This research contributes to the preservation and analysis of Indian classical music traditions while demonstrating the effectiveness of contemporary computational techniques in musicological research.

#### **495. THERMAL AND STRUCTURAL ANALYSIS OF BIPOLAR PLATES OF A PROTON EXCHANGE MEMBRANE WATER ELECTROLYSER**

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Proton exchange membrane water electrolysis (PEMWE) is a cornerstone technology for sustainable hydrogen production, yet its widespread adoption is hindered by the high cost and durability limitations of titanium (Ti) bipolar plates (BPPs). This study computationally investigates the performance of low-cost stainless steel 316L (SS 316L) and Niobium-Titanium (Nb/Ti) coated SS 316L as alternative BPP materials, benchmarking them against conventional Ti BPPs. A multi-physics model is developed in COMSOL Multiphysics® to simulate the thermal, and structural behaviour of PEMWE cells, incorporating the Heat Transfer in Solids interfaces. The model evaluates critical performance parameters, including thermal and structural simulation of the above-mentioned materials across the Bipolar plates. Niobium-Titanium (Nb/Ti) coated SS316L is possessing higher stress concentration due to the multilayer material present compared to monolithic Titanium and SS316L. SS316L offered the best compromise between thermal uniformity, structural reliability, and cost-effectiveness when compared with other materials.

#### **496. AUTOMATED DETECTION OF CEREBRAL NEOPLASM USING YOLOV11**

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Early and accurate detection of brain tumors is critical for improving patient outcomes in neurological disorders. This project presents an automated system for cerebral neoplasm detection in MRI scans

using state of the art deep learning. Our model, based on the YOLOv11 architecture and trained on a large annotated dataset, achieves high precision in classifying brain images. By leveraging hierarchical feature learning, the system effectively identifies intricate tumor patterns. This innovative approach has the potential to significantly enhance diagnostic accuracy, reduce the workload of radiologists, and accelerate clinical decision-making. Ultimately, this work demonstrates the transformative power of AI in healthcare, paving the way for more efficient and accessible diagnostic tools in medical imaging.

#### **497. SENTIMENT ANALYSIS WITH SPEECH RECOGNITION**

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It is the creation and deployment of an advanced Speech and Voice Recognition System that interprets this study explains how to instantly receive audio signals. The system uses sophisticated signal processing and machine learning algorithms to detect gender differences, age group, and regional accents for audio inputs alone with a high degree of accuracy. This unique method promotes inclusivity in digital spaces by creating new opportunities for tailored interactions and creation of more controlled and focused communication tactics. Also, the SVRS broadens its scope by implementing sentiment analysis to efficiently detect emotional indicators in spoken content.

#### **498. A SURVEY ON VARIOUS SMART CROP HEALTH MONITORING TECHNIQUES**

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This paper proposes to assess the health condition of crops by analyzing key parameters such as Nitrogen, Phosphorus, Potassium (NPK) levels, moisture, pH values, and soil type. Data will be collected experimentally by cultivating various plants in different soil types and recording the corresponding NPK, pH, and moisture values manually. Machine learning algorithms will be employed to predict the health status of the crops based on this data. Additionally, if a crop is found to be unhealthy or moderately healthy, the model will provide recommendations on adjusting NPK levels, pH, and moisture to improve the crop's health. A user-friendly interface will be developed to allow farmers to monitor the health of their crops in real-time and receive actionable insights. This application will help farmers identify potential causes of plant sickness and take appropriate corrective actions to maintain or restore crop health.

#### **499. BLOCK CHAIN-BASED BLOOD AND PLASMA DONATION BY LINKING HOSPITALS WITH DONORS**

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This project aims to develop an online blood and plasma donation system using Java, HTML, CSS, Bootstrap, and SQL. The system will consist of a login and registration page for users, along with two modules for blood and plasma donation. The purpose of the system is to facilitate the process of finding suitable blood and plasma donors for emergency clinic patients. The system will be built using Java for the backend logic, HTML and CSS for the user interface, Bootstrap for responsive design, and SQL for database management. The login and registration page will allow users to create an account and log in to the system securely. The blood donation module will enable users to search for available blood donors based on blood type, location, and other relevant criteria. It will also provide a platform for users to schedule appointments with donors, track donation history, and receive notifications. Similarly, the plasma donation module will allow users to search for plasma donors, schedule appointments, and manage donation records. This module will focus on the specific requirements and processes associated with plasma donation. The system will integrate with a database management system using SQL to store and retrieve user information, donor details, appointment records, and other relevant data. The database will ensure data integrity and provide efficient data retrieval for the system's functionalities.

## **500. AN INTELLIGENT AND ADAPTIVE STEGO IMPERCEPTIBILITY FRAMEWORK FOR ENHANCED SECURITY**

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Image Steganography is the application of hiding secret messages in pictures to enable secure communication without alerting others. Unlike encryption, which alters the data structure and might raise suspicion, steganography covertly manipulates Least Significant Bit (LSB) of pixel values to encode information without lowering the visual integrity of original image. This research investigates LSB-based image steganography, explaining its mechanisms of operation, advantages, and uses in secure data communication. The proposed method ensures minimum distortion, large capacity, and successful extraction of hidden messages, making it a trustful method of secret communication.

## **501. ENHANCING INTRUSION DETECTION WITH SUPPORT VECTOR MACHINES BASED CLASSIFICATION**

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Intrusion Detection Systems (IDS) play a critical role in modern cybersecurity by identifying malicious activity in network traffic. Support Vector Machines (SVMs) are effective for intrusion detection due to their ability to handle high-dimensional data and non-linearly separable patterns. However, the selection of hyperparameters has a significant impact on their performance. Using the NSL-KDD dataset, this paper investigates hyperparameter optimisation for SVM-based IDS. To maximise classification accuracy, precision, recall, and F1 score, we test various kernel functions, regularisation settings, and feature selection techniques. Our results show how hyperparameter adjustment affects

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detection efficiency and highlight the optimal settings for differentiating between attack and normal traffic. The findings help create more reliable network security solutions and offer insights into improving SVM-based IDS.

## **502. WEB BASED BOOK RECOMMENDATION SYSTEM**

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In the era of digitalization metamorphosis, substantiated content delivery has become essential in improving user experience, especially when it comes to online book exploration. The design, implementation, and assessment of a web-based book recommendation system that uses content-based and collaborative filtering techniques to suggest books based on stoner choices are presented in this paper., actions, and conditions. The system integrates the consumer communications, such as browsing history as well as reserve conditions, with induce substantiated recommendations. Also, and recommendations acclimatized to individual tastes. The proposed system was tested with a real- world dataset, and evaluation criteria, including The efficacy of the system was evaluated using precision, recall, and user satisfaction recommendations. Finding show that the recommendation system significantly enhanced user happiness and engagement by offering varied and accurate suggestions for novels. The documentalso discusses challenges faced during development, similar as data sparsity and system scalability, and suggests unborn advancements, including cold-blooded recommendation methods and better handling of dynamic content updates.

## **503. DEEPPAKE AUDIO DETECTION IN BENGALI SPEECH USING RANDOM FOREST AND MFCC ANALYSIS**

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In recent years, the spread of AI-generated the debate has raised significant concerns over online misrepre- sentation, especially in the local languages where identification systems are still underdeveloped. While many studies have centered on English deepfake detection, the particular challenges presented through Bengali medium—marked by its rich phonetic variation and characteristic dialectal forms—have been relatively neglected. This study provides a strong deepfake audio detection system designed for Applying Mel-frequency cepstral coefficients to Bengali speech. (MFCCs) to extract features, our approach identifies significant Auditory signals including characteristics such as pitch, timbre, and formant patterns that Distinguish between natural speech and synthesized speech. A close sive dataset of 25,000 five-second samples of real Bengali language and 15,000 AI-created samples produced The use of advanced text-to-speech technology was intended to inform and evaluate our model. With a Random Forest classifier, our system had over 99unprecedented power to distinguish between human and deepfake audio. This research forms the basis for more secure digital communication in local language environments and offers an accessible and scalable means of eliminating the risks involved with deepfake audio.

## **504. NFT MARKETPLACE FOR PROMOTING INDIAN ART: A REVIEW**

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The emergence of Non-Fungible Tokens (NFTs) has also created new opportunities for collectors and artists in India, enabling ownership and financial transfer of digital artworks. But, Ethereum's network congestion and high gas fee are having serious limits the access of price-sensitive users. This This research examines the rollout of Polygon's Layer 2 scaling solutions. to enhance the cost-effectiveness and efficiency of NFT transactions in the Indian market. An Adaptive Gas Fee implementation Optimization Algorithm, the network would automatically determine gas fees depending on congestion and user demand levels, and being cost-efficient. transactions. NFTs, based on blockchain technology, can be used as unique, un- changeable digital identities, ensuring voter integrity and fraud prevention. The paper discusses Contemporary obstacles faced by conventional electronic voting systems, particularly regarding se- curity. vulnerabilities and trust problems, and explains how NFT- based solutions can solve these issues. The suggested architecture smart contract performance optimizations, meta-transactions, and decentralized storage technologies such as IPFS to improve scalability and usability. A comparison with Ethereum and other Layer 2 solutions highlight Polygon's ability to reduce gas fees by up to 95% without interfering with security and interoperability. This research highlights the revolutionary nature of blockchain technology in facilitating Indian artists, democratizing digital art, and developing a more sustainable and inclusive non-fungible token economy. Subsequent research can explore hybrid Layer 2 techniques and regulatory environments to further drive NFT adoption in India.

## **505. DEVELOPMENT OF AN ADVANCED GESTURE RECOGNITION USING COMPUTER VISION FOR SMART IOT ENVIRONMENT CONTROL**

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Touch-free, easy-to-use approaches of human-computer interaction are in more demand as the Internet of Things (IoT) keeps fast spreading into many domains. In this work we present a novel IoT-based gesture detection system intended to remotely control a metal robotic arm. Integrated with sophisticated gesture detection, this robotic arm uses the YOLO real-time model coupled with a Raspberry Pi camera to regularly take photos to recognize particular hand actions. Instant interpretation of the observed gestures into matching robotic arm motions guarantees fluid and smooth engagement. IoT technologies improve the system even further since they allow remote control and monitoring features. For uses in automation, assistive technologies, and industrial robots especially, this makes the system very beneficial. The method solves important problems such fluctuations in surrounding lighting, background noise, and the need for real-time processing that are typical in gesture detection technology. Our suggested solution uses an advanced deep learning technique called convolutional neural networks (CNNs) to precisely recognize gestures with great responsiveness. The core processor of the Raspberry Pi unit detects gestures, classifies them, coordinates communication with the metal robotic arm, This integration guarantees not only accurate and quick response but also offers a reasonably affordable and effective way to improve human-robot interactions.



The system's general dependability, responsiveness, and recognition accuracy were assessed by means of extensive testing and validation processes. Independent of external variables, the results showed the system's capacity to consistently interpret hand gestures into exact robotic orders in real time. IoT integration increases this resilience by enabling the system to operate in remote situations and hence increase its relevance in many different fields.

This work marks a significant progress in the creation of complex, touchless control systems, therefore enabling revolutionary uses in fields such as assistive robotics, industrial automation, and healthcare.

#### **506. EXPLAINABLE AI-BASED MULTICLASS INTRUSION DETECTION FOR CYBER-PHYSICAL SYSTEMS USING SUPERVISED LEARNING MODELS**

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Cyber-Physical Systems (CPS) are critical infrastructures that are increasingly exposed to sophisticated cyber threats. This study presents a comprehensive approach to intrusion detection in CPS using multiple supervised machine learning classifiers, including Decision Trees, Random Forests, Logistic Regression, K-Nearest Neighbors, Support Vector Machines, Naive Bayes, and Stochastic Gradient Descent. The proposed system incorporates Explainable Artificial Intelligence (XAI) techniques, namely LIME (Local Interpretable Model-Agnostic Explanations) and SHAP (SHapley Additive exPlanations), to enhance model interpretability and transparency. The experiments were conducted on publicly available intrusion detection datasets, with performance evaluated using accuracy, precision, recall, F1-score, and confusion matrix. The integration of XAI tools provides critical insights into the decision-making process of classifiers, promoting trust and aiding cybersecurity professionals in real-time anomaly identification.

#### **507. AI-DRIVEN WATER QUALITY ANALYSIS AND PREDICTION SYSTEM FOR REAL-TIME MONITORING**

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This paper presents a software solution designed to analyze water quality using an integrated IoT system. The system utilizes the Vega Aries IoT v2.0, coupled with a pH sensor and a turbidity sensor, to monitor real-time water parameters such as temperature, humidity, and contamination levels. The software incorporates an AI model that assesses the potability of water and provides real-time feedback on its safety for consumption. Anomaly detection algorithms are employed to identify irregularities in sensor data, while auto-calibration functionality ensures accurate readings by adjusting sensor coefficients based on known buffer solutions. Additionally, the system offers trend graph plotting and allows users to download water quality data in PDF format for further analysis. The platform is cloud-connected, facilitating remote monitoring and data storage.

#### **508. AI-POWERED SMART CAR ASSISTANT: PREDICTING USER PREFERENCES FOR SPEED, AC TEMPERATURE, AND ENTERTAINMENT BASED ON TRAVEL PATTERNS**

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The AI-Powered Smart Car Assistant is an intelligent system that personalizes user driving preferences such as speed, AC temperature, and entertainment using machine learning. It processes data on location, climate, road type, and user history, encoding categorical values and scaling numerical ones. AC temperature is predicted using a Random Forest Regressor, while speed and driving mode are classified with Random Forest Classifiers. Music preference is handled by an MLP Neural Network. Models are trained on an 80-20 split and evaluated with MAE and accuracy, then deployed using joblib. The system enhances driving comfort and efficiency, with future potential for real-time IoT integration and continuous learning.

### **509. REAL-TIME PHISHING DETECTION BROWSER EXTENSION USING RANDOM FOREST AND API INTEGRATIONS FOR ENHANCED SECURITY**

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In this paper, we propose a real-time phishing detection browser extension using Random Forest (RF) machine learning algorithm, google safe browsing API and Phishtank API to dynamically detect and prevent phishing attacks. This extension classifies websites as legitimate or phishing based on essential URL-based features including HTTPS status, URL length, subdomains, and special characters. It also expands shortened URLs to discover hidden malicious redirects. The given formalism offers an effective, portable and real-time web protection to the users. Phishing Detection Model Random Forest Conclusion Experimental results show that the Random Forest model achieves high accuracy while allowing users to browse seamlessly.

### **510. DESIGN AND IMPLEMENTATION OF PLC-BASED BATCH CONTROL IN BISCUIT MANUFACTURING: FROM PRE-CREAMER TO DOUGH MIXER**

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presents the design and implementation of a PLC- and HMI-based batch process automation system for the biscuit manufacturing industry. The automation targets three critical stages of production: sugar handling, pre-creamer preparation, and dough mixing. The primary objective is to enhance operational efficiency, product consistency, and process reliability while minimizing human error. The core of the system is an Allen-Bradley Micro850 PLC (2080-L50E-48QBB), programmed using Connected Components Workbench (CCW), which facilitates real-time control of ingredient dosing, mixing durations, and material transfer. Accurate weight measurement is achieved through a six-wire load cell connected to a TLB ETH weight transmitter, which communicates with the PLC via Ethernet/IP or Modbus protocols. Dedicated function blocks, such as W\_Series\_MB, enable logic execution based on real-time weight data. A Human-Machine Interface (HMI) provides operators with a graphical platform for process initiation, live monitoring, and parameter configuration. The entire automation system is housed in a custom-built control panel, integrating communication modules, I/O terminals, and protective components. Overall, the work demonstrates a reliable and scalable solution for batch process automation, aligning with modern industrial standards in food manufacturing.

### **511. AI-DRIVEN PARKINSON'S DISEASE DIAGNOSIS, SEVERITY PREDICTION, AND DRUG RECOMMENDATION USING MACHINE LEARNING**

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Parkinson's Disease (PD) is a progressive neurodegenerative disorder affecting motor and cognitive functions. Early detection and severity assessment are crucial for effective disease management. In order to diagnose and forecast the severity of Parkinson's disease (PD), we provide a machine learning-based framework in this study that combines deep learning models, KNN, and Support Vector Machines (SVM). The dataset undergoes preprocessing, feature selection, and class balancing using Synthetic Minority Over-sampling Technique (SMOTE) to enhance classification performance. The proposed approach achieves an improved accuracy of 94% using SVM after dataset balancing. Furthermore, a severity prediction model is implemented using clustering techniques, categorizing patients into three severity levels: Low, Medium, and High. An AI-driven drug recommendation system is integrated, suggesting personalized treatments based on severity levels. The findings show that machine learning is useful in diagnosing Parkinson's disease (PD), and the suggested framework provides a dependable, comprehensible, and expandable approach to automated illness evaluation and management.

### **512. REVOLUTIONIZING TEXT CLASSIFICATION IN EXPERT SYSTEMS WITH LLMS**

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The development of Large Language Models (LLMs) has greatly expanded the discipline of Natural Language Processing (NLP), which includes text classification as a core job. This paper presents an innovative approach known as the Smart Expert System, which makes use of LLMs for text

classification. This solution eliminates the requirement for in-depth preprocessing and domain-specific expertise, simplifying conventional text categorisation techniques. We assess how well some optimised large language models (LLMs), machine learning (ML) techniques, and neural network (NN)- based models perform across three datasets. Furthermore, we explore the impact of Hyperparameter Optimization (HPO) in fine-tuning LLMs. The results demonstrate that fine-tuned large language models (LLMs), particularly those optimized using hyperparameter optimization (HPO), outperform traditional methods and finetuned LLMs. all approaches, the fine-tuned model with HPO consistently delivers superior performance across all datasets.

### **513. PLC BASED MONITORING AND PREDICTION OF PIPELINE LEAKAGE DETECTION USING THINGSPEAK IOT**

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Pipeline systems play a critical role in transporting water, oil, gas, and other fluids across vast distances. However, undetected leakages can result in significant economic loss, environmental hazards, and safety risks. This paper presents a PLC and HMI-based system for real-time monitoring and predictive detection of pipeline leakages. The proposed architecture integrates sensor nodes, communication modules, and data analytics to continuously collect parameters such as flow rate at the inlet and outlet of the pipeline. These sensor signals are processed by a Programmable Logic Controller (PLC), which performs logic-based decisions for immediate leak detection and system control. An integrated Human-Machine Interface (HMI) provides real-time visualization, alerts, and user interaction for system diagnostics and monitoring. Additionally, the system incorporates data logging and trend analysis using ThingSpeak IoT to enable predictive maintenance and early fault identification. Experimental validation demonstrates high reliability, quick response time, and adaptability to various pipeline configurations. This approach offers an efficient and cost-effective solution for enhancing the safety and operational continuity of pipeline infrastructure.

### **514. TECHNIQUES FOR OPTIMIZING ARRAY MULTIPLIERS: A COMPARATIVE ANALYSIS**

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The paper presents several approaches and strategies in array multipliers to offer improved optimization and uses in signal processing. The  $8 \times 8$  array multiplier has been implemented using non-pipelined, pipelined, and wave pipelined techniques; their performance in terms of resource use characteristics, area, power, and delay is compared using the synthesis report produced from the Artix-7 FPGA synthesis tool. The  $8 \times 8$  array multiplier is first built using fundamental gates known as AND and OR gates and implemented on the Artix-7 FPGA. An  $8 \times 8$  combinational array multiplier is subjected to the 3-stage pipeline technique, which involves adding extra registers between the combinational logic and it was observed that inserting an extra register between the combinational logic consumes the maximum space therefore, proposed a wave-pipeline technique that eliminates the intermediate registers of pipeline techniques, resulting in less area. The above three approaches have been synthesized in Artix-7 FPGA tool and based on the synthesis report for implementation of array multiplier with 3-stage pipelined architecture offer better results in terms of delay and saves 26% of delay compared to without pipeline architecture but pipeline architecture consume maximum area where wave-pipeline architecture for array multiplier offer better Result and saves 43.75% area compared to 3-stage pipeline. When comparing in terms of power pipeline architecture to the wave pipeline, the pipeline provides a greater result and saves 98.08%.

## **515. AUTOMATED DOCUMENT SUMMARIZATION USING NLP AND DEEP LEARNING FOR ENHANCED INFORMATION PROCESSING AND ANALYSIS**

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The burst of digital text data has called for the creation of automatic text summarization methods to retrieve necessary information in a more efficient manner. Text summarization reduces amounts of text while holding valuable information. This document investigates numerous summarization methods, of which extractive methods are notable, with special reference to deep learning methods like Google Pegasus for abstractive summarization. In addition, we present a new hierarchical clustering-based multi-document summarization technique that improves coverage and diversity through the use of commonality and specificity among multiple documents. Experimental results show that combining both commonality and specificity greatly improves summary quality over state-of-the-art multi-document summarization methods with better ROUGE score performance.

## **516. ENHANCED EMAIL SPAM DETECTION USING A HYBRID DEEP LEARNING MODEL APPROACH**

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With the fast development in e-mail communication, spam has gotten to be a humongous issue with genuine security concerns like phishing, malware contamination, and information breaches. Conventional spam channels fair are not able to keep up with the modern strategies of work being always actualized by spammers. To address this challenge, this paper proposes a crossover profound learning show that combines the focal points of Convolutional Neural Systems (CNN) and Long Short-Term Memory (LSTM) systems to encourage moved forward spam discovery. The CNN component identifies nearby designs in words—like particular word combinations normal in spam—and the LSTM layer is connected to get it the meaning and word arrangement, picking up on the generally structure of an email. We utilized a labelled dataset comprising of both spam and non-spam (ham) messages. The information was prepared through different preprocessing operations, counting cleaning, tokenization, and word inserting. We too connected a Recurrent Learning Rate (CLR) learning rate approach amid the preparing prepare of the demonstrate and connected information expansion methods in an endeavour to increment the differences of the input samples. Our test comes about appear that the cross-breed show of CNN-LSTM beats other conventional machine learning procedures by distant. To make this arrangement usable and viable, we moreover built a straightforward web application with Carafe so that the clients can check mail substance for spam in genuine time.

## **517. NETWORK TRAFFIC ANALYSIS AND SIMULATION USING REAL-WORLD SOFTWARE DEFINED NETWORK DATA MODEL**

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This research paper is innovative research and works towards an intelligent application of network traffic filters, or for a similar context, similar to a smart firewall. This combines network traffic analysers with a pinch of intelligent models which can assist it in integrating security and learning simultaneously. Today's networking demands require features such as efficiency, scalability, flexibility, intelligence, and compatibility with today's ever-changing standards. It is primarily used to provide maximum performance, satisfaction, and strong security. Conventional network management in today's times is very complicated, and at most times, rigid, without much flexibility. Software-defined networking (SDN) is intelligent and adaptive to the existing models, further strengthening the networks and cementing them even more. This paper examines the contribution of SDN to advanced network traffic analysis, focusing on real-world data models like OpenFlow, P4, and telemetry-based SDN. In addition, we present a machine learning-enhanced framework for anomaly detection and performance improvement in SDN networks. Experimental findings prove that traffic monitoring in SDN-based networks improves the accuracy of anomaly detection by 17%, network congestion by 22%, and bandwidth utilization by 18%. Our research emphasizes the increasing relevance of AI-enabled analytics in SDN networks to attain adaptive, secure, and high-performance networking.

## **518. SMART SYSTEM FOR BRAIN TUMOR DETECTION**

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Brain tumors represent a critical area of concern in modern medicine due to their potential to significantly impair both cognitive and physical functions. The success of treatment is often dependent on how early and accurately these tumors are identified and classified. Traditional diagnosis methods, while effective in skilled hands, are typically slow, laborious, and susceptible to human error. In this project, we introduce a comprehensive deep learning-based system that performs both classification and segmentation tasks to efficiently detect brain tumors in MRI scans. Our system makes use of the

EfficientNetV2M model for the classification of tumor types and an improved version of the U-Net architecture for precise segmentation of tumor regions. To boost the model's effectiveness, input data undergoes thorough preprocessing techniques such as denoising, normalization, and data augmentation. By combining the power of two deep learning models, the proposed framework provides accurate results and offers practical support for radiologists in clinical settings. This research underscores the potential of deep learning technologies in transforming medical image analysis.

## **519. SMART TRAFFIC MANAGEMENT SYSTEM WITH DYNAMIC SIGNAL CONTROL**

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Traffic congestion, particularly in urban areas, is a growing challenge driven by factors such as limited road capacity, high demand, and lengthy red light durations. Addressing these issues requires advanced solutions for real-time traffic management. This paper introduces a method for estimating traffic density using live camera feeds at traffic junctions, employing image processing techniques to provide accurate, real-time vehicle counts. The system dynamically adjusts traffic light timings based on current traffic conditions, aiming to reduce congestion, minimize accident rates, and decrease fuel consumption and waiting times. In addition, it offers valuable data for future road planning and analysis. Unlike traditional systems that rely on embedded sensors, this approach leverages visual data, enhancing reliability and efficiency by avoiding unnecessary delays and optimizing signal control. Ultimately, it aims to improve traffic flow and safety, potentially paving the way for synchronized traffic light systems and more effective urban traffic management.



# FIFTEENTH INTERNATIONAL CONFERENCE ON SCIENCE AND INNOVATIVE ENGINEERING (ICSIE 2025)

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