

BIBLIOGRAPHY OF PROJECT REPORTS

ACADEMIC YEAR: 2023-2024

**DEPARTMENT: ELECTRONICS AND TELECOMMUNICATION
ENGINEERING (ExTC)**

Title: Real Estate Recommendation System

Author: Yash Malavde, Mihir Mandaliya, Bhavin Mehta, Linette Pereira

Project Guide: Deepak Jayaswal

Abstract: On e-commerce websites, as much required variety and richness as possible to find what they need in one market, online catalogs are sometimes too overwhelming. Recommender systems play an important role in e-commerce websites because they improve the customer journey by helping users find what they want at the right moment. The real estate sector, like the vast world of e-commerce, covers a broad range of properties, serving a diverse user base of buyers, sellers, builders, and channel partners. However, existing online platforms often overwhelm users with an abundance of choices, leading to decision confusion and unexpected initial expenses for buyers, sellers, and builders. In this work, we focus on to establish a communication link from the User to the Channel Partner to the Builders. Our project tackles this issue by initially considering user preferences utilizing K-means Clustering for property grouping and providing recommendations. Additionally, we have incorporated multiple Machine Learning algorithms for price prediction. To enhance user interaction, we integrated a chatbot using the NLP algorithm Llama 2, making the system more user centric. Through this, we aim to simplify the real estate experience, cutting through the excess of listings and eliminating initial hidden fees. This communication link solution, seamlessly integrated into the AWS EC2 Cloud instance, promises a future where real estate transactions are efficient, transparent and user centric. This is particularly crucial in empowering the users to make informed decisions with correct guidance in their lives.

Acc.No: PR 2401/ EXTC543

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Personalized Health Recommendation System

Author: Sakshi Jadhav, Ibrahim Parkar, Tanishque Prajapati, Anand Tripathi

Project Guide: Vaqar Ansari

Abstract: Many health disorders remain undetected due to inadequate access to health recommendation systems. The core objective of this project is to develop a health website capable of harnessing individual health data to generate health recommendations. These recommendations empower users to make informed decisions regarding their health, ultimately leading to early detection and more effective management of health issues. Machine Learning is essential in predicting the presence/absence of diseases like arrhythmia, Sleep Apnea, Insomnia, and Stroke. Such Diseases, if predicted well in advance, can provide important intuitions to doctors who can then adapt their diagnosis. In this project, Machine Learning algorithms such as Logistic Regression, Random Forest, and Voting classifier are trained to analyze health data, and a health website is developed to serve as the user interface with the trained algorithms. The project aims to seamlessly integrate various health data sources, smart devices, and user-generated data. ML algorithms analyze this information, considering medical history, lifestyle, and preferences to offer recommendations. By focusing on early detection and encouraging proactive health management, this initiative has the potential to revolutionize healthcare. It empowers individuals to take a more active role in their well-being, promoting timely interventions and improved health outcomes.

Acc.No: PR 2402/ EXTC544

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Machine learning based multi asset price prediction

Author: Apoorva Kharul, Henish Jain, Kanhaiya Singh, Zeba Shaikh

Project Guide: Ravindra Chaudhari

Abstract: The historical significance of precious metals, including gold and silver, as well as the economic importance of commodities such as crude oil, spans millennia, with their roles evolving over time. From serving as forms of currency to acting as crucial indicators of economic stability, these assets play pivotal roles in global markets. This project employs advanced machine learning techniques to predict the prices of gold, silver, and crude oil. Our primary objective is to provide stakeholders with predictive insights for informed decision-making and risk management in financial markets. To accomplish this, we leverage advanced machine learning algorithms, including Random Forest regression and Gradient Booster regression. Moreover, our predictive framework goes beyond traditional metrics; we've integrated technical indicators such as Bollinger's Bands, MACD (Moving Average Convergence Divergence), and RSI (Relative Strength Index) into our models. These indicators enrich our predictive capability by providing additional layers of insight into market trends and sentiment. Our findings indicate that the random forest regression model works exceptionally well in predicting same day closing prices for all the assets, achieving remarkable R2 scores of 0.97, 0.99, and 0.99 for gold, silver, and crude oil, respectively. Additionally, the models yielded strong results for next day closing price prediction, with R2 scores of 0.84, 0.79, and 0.97 for gold, silver, and crude oil, demonstrating the effectiveness of our approach.

Acc.No: PR 2403/ EXTC545

LEARNING AND INFORMATION RESOURCE CENTRE

Title: NLP QuizCraft:Crafting Objective Quizzes

Author: Shreyash Gavad, Ashutosh Mishra, Manisha Thakur, Kavya Mehta

Project Guide: Quanitah Shaikh

Abstract: In the landscape of educational technology, the fusion of Natural Language Processing (NLP) and Transformer models presents a paradigm shift in instructional design and assessment strategies. This project explores the innovative application of NLP techniques, particularly leveraging the T5 Transformer model, to generate objective type questions and perform text summarization tailored for educational contexts. The dataset, curated from technical textbooks, enriches the process by providing domain-specific content. By fine-tuning the T5 model on this specialized dataset, the study achieves the generation of three types of objective questions - Multiple Choice Questions (MCQs), Fill-in-the-Blank (FIB) questions, and True or False questions - offering educators versatile assessment tools. Additionally, text summarization techniques are employed to condense large volumes of educational content into concise summaries, facilitating efficient knowledge acquisition. Through rigorous experimentation and evaluation, this research elucidates the effectiveness and implications of NLP-driven question generation and text summarization in enhancing pedagogical practices. By harnessing the capabilities of advanced NLP and Transformer models, educators can foster personalized learning experiences, promote deeper comprehension, and adapt to the evolving demands of twenty-first-century education.

Acc.No: PR 2404/ EXTC546

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Detection and Classification of Thyroid Nodules in Ultrasound Images using Deep Learning

Author: Om Naik, Jonathan Dcruz, Sakshi Dixit

Project Guide: Pallavi Patil

Abstract: The project addresses the critical need for accurate classification and detection of thyroid nodules, a common concern in medical diagnostics. Thyroid nodules are abnormal growths or lumps in the thyroid gland, which can be benign or malignant. To aid in diagnosis, the Thyroid Imaging Reporting and Data System (TIRAD) assigns a score to ultrasound images of thyroid nodules based on their characteristics, ranging from TIRAD1 (benign) to TIRAD5 (highly suspicious for malignancy). In this study, we leveraged deep learning techniques, specifically the Convnext architecture, to classify ultrasound images of thyroid nodules into seven classes corresponding to different TIRAD scores: TIRAD1, TIRAD2, TIRAD3, TIRAD4a, TIRAD4b, TIRAD4c, and TIRAD5. By preprocessing and augmenting the dataset, we increased its size and variability, enhancing model generalization. In this study, we implemented the ConvNext model for thyroid nodule classification, demonstrating its superior performance compared to ResNet50. Our results indicate that ConvNext achieved notably higher accuracy, underscoring its efficacy in this context.

Acc.No: PR 2405/ EXTC547

LEARNING AND INFORMATION RESOURCE CENTRE

Title: An Application Based on Quadcopter

Author: Maithili Shelar, Jidnasy Vaiti, Rakhi Vishwakarma, Nikita Singh

Project Guide: Jayasudha Koti

Abstract: A tremendous increase in the sale of goods through E-commerce websites, which is ever-increasing, has caused an increase in the load on manpower. Along with the manpower the time taken can also be reduced by using unmanned quadcopters. In addition, the quadcopter can be used for surveillance, in inaccessible areas. We can use UAVs in numerous sectors like disaster rescue, industry for shipping cloth in much less time, Agriculture to check the condition of crops and the navy use has grown as consistent with the capability of quadcopter to operate in crucial regions while keeping their operators at a secure distance. The project goal is to design a Quadcopter for agricultural use. The Quadcopter is designed to be small enough so that costs would be minimized. It is used for agricultural viewing and surveillance. The aerial Quadcopter used for agricultural surveillance is an unmanned vehicle mounted with a camera to detect the animals to protect the field from damage caused by animals reducing the human effort

Acc.No: PR 2406/ EXTC548

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Chamfering Machine for Rack Gear

Author: Vyomkesh Mulam, Ritik Patel, Aaron Remedios, Rosario Rodrigues

Project Guide: Savita Kulkarni

Abstract: The current state of rack gear manufacturing processes is marked by inefficiencies, particularly in the critical chamfering phase. Rack gears are integral components in various mechanical systems, especially those requiring linear motion like automotive steering, industrial machinery, and robotics. Achieving precise machining is essential for their smooth operation. However, chamfering poses challenges due to the gear's unique geometry. Our proposed machine addresses these challenges with innovative design and advanced machining techniques. Equipped with a precision cutting tool tailored for rack gear teeth, it ensures high accuracy and repeatability. Adjustable parameters accommodate various gear sizes and geometries. Its robust structure ensures stability, while a user-friendly interface allows easy programming. Safety measures are integrated to protect operators and workpieces. The machine enhances efficiency and productivity, contributing to cost savings and improved throughput.

Acc.No: PR 2407/ EXTC549

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Real Time Health Analytic System

Author: Mrunmayee Patil, Khyati Sailor, Harsh Doshi, Shravan Kawale

Project Guide: Anjali Chaudhari

Abstract: The development of a Real-Time Health Analytic System leveraging ESP32 as the main controller, combining hardware and software components. This system integrates various sensors to monitor critical health metrics such as Heart rate, body temperature, fall detection, SPO2, saline water levels detection, and humidity level. Data is promptly transmitted to a local host database, enabling accessibility via a web interface. An emergency alert system is incorporated to notify medical professionals, caregivers, and patients in urgent situations. To further enhance the system's utility, algorithms for data analysis, offering health advice based on the collected data. This comprehensive healthcare solution encompasses sensor integration, data management, real-time data presentation, and advanced analytic, addressing the healthcare needs of users while ensuring data security and regulatory compliance.

Acc.No: PR 2408/ EXTC550

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Myoelectric Prosthetic Arm with FPGA based Control System

Author: Shantanu Wanivadekar, Prachi Pandey, Tejas Vaidya, Rahul Nayak

Project Guide: Ravindra Chaudhari

Abstract: In medicine, a prosthesis or a prosthetic implant is an artificial device that replaces a missing body part. According to the IHME in 2017, 57.7 million people were living with limb amputation due to traumatic causes worldwide. Leading traumatic causes of limb amputation were falls, road injuries, other transportation injuries, and mechanical forces. Currently, the prosthetics available on the market are heavyweight and expensive. For many amputees, these devices are unaffordable. The aim is to make these devices affordable for the vast population. Without affordable prosthesis solutions in the market, it denies middle-class to lower-middle-class families prosthetic solutions with essential arm functions. This work presents a prosthetic arm that consists of a 3D-printed structure, an EMG (Electromyography) sensor, and an FPGA (Field Programming Gate Array) based control system. The arm mechanism consists of three opposing fingers arranged in the manner of an equilateral triangle. These fingers' closing and opening are controlled via links connected to the guide pin which is then connected to the guide rail. The linear actuator actuates this guide rail. The FPGA processing board controls the linear actuator based on the signals received by the EMG sensor which will be enclosed in a 3D-printed shell. Introducing a cost-effective prosthesis alternative, enabling essential arm functions. Providing a better life for individuals unable to afford expensive prosthesis solutions. The results demonstrate the effectiveness of utilizing EMG sensors with an FPGA control system to create a responsive and intuitive three-fingered prosthetic arm. The high accuracy, minimal response time, and excellent usability indicate the potential for this technology to significantly improve the quality of life for individuals with upper limb amputations.

Acc.No: PR 2409/ EXTC551

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Waste Segregation System using Machine Learning and IoT

Author: Vaiday Sawant, Vishal Shirke, Vivek Chaudhary,

Project Guide: Uday Pandit Khot

Abstract: Waste management is a critical global concern, with mounting environmental challenges. "Waste Segregation Systems" is a comprehensive project aimed at addressing this issue through the development and implementation of efficient waste segregation solutions. This project encompasses a multidisciplinary approach, combining engineering, environmental science, and social awareness. It explores the effectiveness of automated waste segregation systems, sensor-based sorting, and community engagement in promoting waste separation at the source. The research is complemented by case studies and field experiments in diverse settings to evaluate the practicality and efficiency of different segregation methods. Waste Segregation Systems not only seeks to find technological solutions but also strives to instill a sense of responsibility and awareness within communities, encouraging sustainable waste disposal practices

Acc.No: PR 2410/ EXTC552

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Wireless power transfer system for road powered EV

Author: Samir Gosavi, Vedant Kocharekar, Sai Khale, Ravikant Chavan

Project Guide: Anjali Chaudhari

Abstract: The design of solar powered charging station for charging of electric vehicle that solves the key downside of fuel and pollution. Electric vehicles have now hit the road worldwide and are slowly growing in numbers. Apart from environmental benefits electric vehicles have also proven helpful in reducing the cost of travel by replacing fuel by electricity which is way cheaper. Wel here we develop an EV charging system that solves with a unique innovative solution. This EV charges vehicles without any wires, no need to stop for charging, vehicle charges while moving. Solar power for keeping the charging system going, no external power supply needed. The system makes use of a solar panel, battery, transformer, regulator circuitry, copper coils, AC to DC converter, controller and vehicle motor/battery to develop the system. The system demonstrates how electric vehicles can be charged while moving on the road, eliminating the need to stop for charging. Thus, the system demonstrates a solar powered wireless charging system for electric vehicles that can be integrated in the road.

Acc.No: PR 2411/ EXTC553

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Police assistant resource management suite

Author: Saachi dalvi, Jeet Yadav, Jishant Patil, Sheetal madhesiya

Project Guide: Jovita Serrao

Abstract: The program that has to be created is called Police Assistant Resource Management Suite. This project will assist in handling all police station operations. The Online Crime Reporting and Police login System is an application that covers the entire case management system. Alternatively, we are offering the police login via which they can access and examine public complaints as well as update their working records and promotion system. The majority of duties are now completed by hand, but managing the operational systems within a police station can be made simple and efficient by computerizing every activity

Acc.No: PR 2412/ EXTC554

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Diabetic Retinopathy Detection using Neural Network

Author: Ameesha Pramod, Jatin Bhoir, Suraj Chaudhary

Project Guide: Valentina Rani Basker

Abstract: Diabetic retinopathy (DR) is a common complication of diabetes that causes damage to the retina that affects vision. If not detected in time, it can lead to blindness. Unfortunately, DR is not a reversible process and treatment only preserves vision. Early detection and treatment of DR can significantly reduce the risk of vision loss. The manual diagnosis of retinal fundus images by ophthalmologists is time-consuming, labor-intensive, and expensive, and unlike computer-based diagnostic systems, it is prone to misdiagnosis. Recently, deep learning has become one of the most common techniques that have achieved better results in many fields, especially in medical image analysis and classification. Convolutional neural networks are more widely used as a deep learning method for medical image analysis and are very powerful. Recently, DR color image recognition and deep learning classification methods are reviewed and analyzed. In addition, DR datasets of the iris, fundus, and retina were reviewed.

Acc.No: PR 2413/ EXTC555

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Real Time DDoS Attack Detection and Mitigation Based on Splunk.

Author: Aston Dsouza, Prathamesh Hadkar, Anush Irde, Sankalp Hegde

Project Guide: Ramjee Yadav

Abstract: A DDoS attack is when someone intentionally tries to interrupt the regular flow of data to a specific server, service or network by overwhelming it with a massive amount of internet traffic. DDoS attacks are successful by leveraging numerous compromised computer systems to generate attack traffic. Machines that are taken advantage of can include computers and other network-connected resources like IoT devices. In simpler terms, a DDoS attack can be compared to an unforeseen traffic jam on a highway, which disrupts the usual flow of traffic and prevents it from reaching its intended destination. In our project we have developed a model which is going to detect and mitigate DDoS attacks in real time. This model is deployed on cloud, comprising of Ubuntu machines which is used to launch attack and Windows machine which acts as the victim. The attackers launch an attack by sending huge volumes of data traffic to the victim. Splunk is installed on the Victim machine. The victim machine generates logs which are captured by Splunk tool. We then use Splunk to analyze and visualize these logs. If the machine is under attack, it generates an alert, thereby signaling the user. The type of attack can be classified on the basis of traffic that is being used. We then confirm whether the machine is under attack by the volume and type of traffic. Splunk also gives insights as to which port number is being targeted. The user then switches off the corresponding port or applies firewall to mitigate the attack.

Acc.No: PR 2414/ EXTC556

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Smart Wheelchair using ESP32

Author: Sahil More, Soni Yadav, Subrato Dey

Project Guide: Snehal Lopes

Abstract: Traditionally, any object can be moved by some external force which is generally human effort. Our project aims to move distant physical objects with little hand movements. The project "Smart Wheelchair Using ESP32" powered by the ESP32 microprocessor, tackles the dual problems of mobility and medicine management. The ESP32 functions as the central control unit, enabling intelligent medication distribution and wheelchair mobility. The smart wheelchair provides hand gesture control, obstacle avoidance, and navigation support. With the use of a hand gestures users may remotely operate the wheelchair, safely explore their surroundings, and get real-time directions. The integrated medicine box features separate compartments with level-monitoring sensors. The ESP32 communicates with the box, tracking medication schedules and ensuring timely, accurate dosing. It also sends reminders and alerts. A user-friendly Interface complements the system, enabling medication scheduling, wheelchair customization, and real-time monitoring. This connectivity enhances convenience, safety, and accessibility.

Acc.No: PR 2415/ EXTC557

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Secure online voting system using blockchain

Author: Kunal Gawade, Navya Pillai, Mahin Shetty, Alisha Dsouza

Project Guide: Snehal Lopez

Abstract: Online voting represents a digital evolution of traditional ballot casting, allowing voters to participate remotely via electronic platforms. This paper introduces a secure online voting system fortified with blockchain technology and the SHA-256 algorithm. Online voting systems enable voters to cast their ballots over the internet, eliminating the need for physical presence at polling stations. Leveraging blockchain's decentralized architecture, the proposed system ensures tamper-resistant storage and validation of votes, enhancing trust and integrity in electoral processes. Advanced safety features, inspired by the mechanisms found in chamfering machines, mitigate the risk of human error and prioritize voter safety. Through automation capabilities, akin to those streamlining manufacturing processes, the voting system minimizes manual intervention and ensures precise, consistent results. This innovative approach not only enhances the security and efficiency of online voting but also fosters trust and competitiveness in democratic processes. By drawing parallels with the role of chamfering machines in manufacturing, this paper underscores the importance of continuous technological advancements in optimizing electoral procedures and preserving democratic principles.

Acc.No: PR 2416/ EXTC558

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Surveillance Car with Gesture-Controlled Manipulator

Author: Yash Nayak, Prabhakar Nilam, Dhanashree Wadaye, Vishal Yadav
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Project Guide: Vaqar Ansari

Abstract: In this proposed work, a gesture-based surveillance car and a gesture-based robotic arm are designed to perform various real-life tasks. The entire bot systems perform its motion based on the gesture inputs received from the user. The user can control the bot with very precise motions and with efficiency. For the surveillance part of the project the bot is equipped with FPV (First Person View) camera with a built-in transmitter. FPV camera functions based on RF Transmission which provides a better range and easy connectivity. FPV camera configured to a particular channel and band enables the camera to connect any RF based receiver such as FPV goggle, RF based monitors or OTG receiver.

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Acc.No: PR 2417/ EXTC559

LEARNING AND INFORMATION RESOURCE CENTRE

Title: An Attention-Based Wavelet Neural Network for Epilepsy EEG Classification.

Author: Siddharth Bardiya, Ritik Chaudhari, Darshit Mehta, Ansh Chirawawala

Project Guide: Savita Kulkarni

Abstract: Epilepsy is a neurological disorder characterized by unpredictable seizures, making accurate and timely classification of electroencephalogram (EEG) data is crucial for diagnosis and treatment. In this study, we propose an innovative approach that combines the power of Attention-Based Wavelet Neural Networks to enhance the accuracy of EEG classification. By incorporating attention mechanisms, the Neural Network model effectively captures both spectral and temporal features in EEG signals, improving the discrimination of epileptic and non-epileptic patterns. Experimental results on benchmark EEG datasets demonstrate the model's superior performance, outperforming conventional methods. This research contributes to the advancement of EEG-based epilepsy diagnosis and lays the foundation for more effective and reliable patient care.

Acc.No: PR 2418/ EXTC560

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Gas level Detection and fire alert system

Author: Pallavi A. Chavan, Dhruvik Shah, Shradhesh Tiwari,

Project Guide: Uday Pandit Khot

Abstract: The Gas Leakage Detection System presented in this study integrates various sensors and modules with a NodeMCU platform to ensure comprehensive safety measures. The system employs an MQ2 sensor for gas leakage detection, providing early warnings of potentially hazardous situations. Additionally, a flame sensor is incorporated to detect fire outbreaks promptly. To monitor gas cylinder levels, an HX711 and Load Cell system accurately weigh the cylinder, triggering alerts when levels fall below a predefined threshold. Furthermore, the system utilizes the SIM800L module for SMS alerts, notifying users of low gas levels or fire/smoke incidents in real-time. This integrated approach enhances safety in residential and commercial settings, offering proactive measures against gas leaks and fire hazards.

Acc.No: PR 2419/ EXTC561

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Patient data management using Blockchain

Author: Ashutosh Maurya, Sakshi Kapadnis, Bhoomika Sonkamble, Rutuja Pethkar

Project Guide: Ramjee Yadav

Abstract: The current healthcare system has traditionally relied on paper-based medical records or electronic medical records (EMRs) that are stored in centralized databases. This method, however, has shown to be ineffective and unreliable, causing major delays in patient care. Medical documents are frequently sent over email as a temporary fix; however, this approach is unsafe and unreliable. Blockchain technology can provide a more secure, decentralized, and efficient way to store and share medical records. Blockchain offers a tamper-proof and auditable method to trace transactions while using cryptographic methods to secure the integrity and confidentiality of data, access to patient data, and modifications.

Patients, physicians, and hospitals may easily, anytime, anywhere, and with total safety and security, access medical records via a decentralized blockchain network. Patients have discretion over who gets access to their information and can allow healthcare professionals and organizations access to their medical records. We are employing several technologies, like MetaMask, Hardhat, Web3JS, and Solidity, to develop a blockchain-based solution. A centralized blockchain network that can safely store and distribute patient data is the predicted result of a blockchain-based system for medical record sharing. The system's interoperability and scalability is ensured via integration with already existing healthcare systems and databases. Medical record sharing may be automated with smart contracts, allowing for safe and auditable access based on predefined criteria and permissions.

Acc.No: PR 2420/ EXTC562

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Parkinson's Early Detection Using Deep Learning

Author: Kaustav Mhaskar, Runmay Shirsat, Arif Shaikh, Sumant Singh

Project Guide: Shilpa Chaman

Abstract: Parkinson's Disease is a neurodegenerative disorder that progressively affects motor function and cognition. Early detection is crucial for effective intervention and management of PD. In this study, we propose a novel multimodal approach for early detection of Parkinson's Disease. Our model integrates voice and spiral drawing datasets and employs machine learning and deep learning techniques for analysis and classification. Specifically, we utilize K-means clustering, Decision Tree, and Convolutional Neural Networks for feature extraction and classification. The model is trained on a comprehensive dataset comprising voice recordings features and hand-drawn images of individuals with varying degrees of PD severity. Performance evaluation demonstrates promising accuracy in detecting and classifying individuals with PD based on voice and image features. Our results suggest that the proposed multimodal approach offers a non-invasive, cost-effective, and efficient solution for early PD detection. This has significant implications for improving clinical diagnosis and patient care.

Acc.No: PR 2421/ EXTC563

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Sentiment Analysis and Topic Modeling of Online Product Reviews

Author: Haris Shaikh, Esha Tewari, Abhishek Vimal, Riya Yadav

Project Guide: Deepak Jayaswal

Abstract: Sentiment analysis, also known as opinion mining, is used to evaluate the sentiments expressed within customer reviews and comments about various products. Topic modeling is used to categorize and group reviews and comments

into distinct topics or themes. These are critical components of this project, enriching the recommendation system's capability to provide personalized and contextually relevant product suggestions based on customer sentiment and prevalent discussion topics. These techniques enable users to enhance their overall shopping experience. By amalgamating these insights, we create a recommendation engine that factors in customer sentiment, topic prevalence, and review quality, empowering users to make well-informed purchasing decisions. This project demonstrates the potential of data-driven decision-making, highlighting the influence of machine learning and natural language processing techniques in enhancing the consumer's shopping experience while offering valuable product recommendations.

Acc.No: PR 2422/ EXTC564

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Network Traffic Forecasting using Deep Learning

Author: Falguni Sheladiya, Prakhyath Shetty, Aryan Singh, Archit Sinha

Project Guide: Monika Cheema

Abstract: Network traffic forecasting is an essential component of network management. This increasing importance of network traffic forecasting in modern network management has prompted the development of advanced predictive systems leveraging deep learning methodologies. In response to the critical need for reliable and efficient network performance, this project focuses on harnessing the capabilities of Gated Recurrent Units (GRU) and Long Short-Term Memory (LSTM) algorithms for accurate network traffic forecasting. Using the cloud computing resources provided by Amazon Web Services (AWS), we have established a scalable data collection pipeline and optimized deep learning models to predict network traffic trends with precision and adaptability. By experimenting with different architectures, hyperparameters, and input features, we aim to enhance the accuracy and efficiency of network traffic forecasting techniques. Through comparative analysis between GRU and LSTM models, insights into the effectiveness of deep learning in network traffic forecasting are gained, contributing significantly to advancing network management practices for businesses and organizations across industries.

Acc.No: PR 2423/ EXTC565

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Blood distribution system using blockchain

Author: Sakshi Tiwari, Ruchir Buddhisagar, Harsh Gupta, Shreya Prakash

Project Guide: Pallavi Patil

Abstract: This project addresses the critical need for an efficient and secure blood distribution system by harnessing the power of private Ethereum blockchain technology. The existing blood distribution systems often suffer from inefficiencies and a lack of transparency, which can result in errors and difficulties in tracking blood units. To overcome these challenges a decentralized and transparent platform that ensures real-time tracking and traceability of blood units is proposed which enhances the reliability and effectiveness of the blood distribution process. The primary issue to address involves ensuring the secure and efficient distribution of blood, which is vital for saving lives in critical situations. Most existing Traditional systems lack the seamless structure which involves Paperwork and Manual Tracking and Centralized Databases prone to errors, time-consuming to manage, and lacks real-time visibility into the blood inventory and often struggle to maintain the integrity of sensitive blood-related data. Therefore, a blockchain-based solution is implemented to revolutionize the way blood is distributed.

Acc.No: PR 2424/ EXTC566

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Blockchain for Secure Bank Transaction

Author: Joston Langrimari, Saylee More, Chandan Pandey

Project Guide: Monica Cheema

Abstract: The adoption of blockchain technology has brought significant advancements to the banking sector, particularly in enhancing transaction security and introducing innovative features. In this project, we have integrated blockchain into a banking application, not only to fortify transactional security but also to incorporate additional functionalities such as loan services. By leveraging blockchain's decentralized ledger and cryptographic mechanisms, we ensure the integrity and immutability of transaction data, bolstering trust and transparency among users. Moreover, the inclusion of loan features extends the utility of our application, providing users with convenient access to financial services within a secure and efficient framework. Through the synergy of blockchain technology and banking services, our project sets a new standard for modern financial applications, prioritizing security, transparency, and accessibility.

Acc.No: PR 2425/ EXTC567

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Ecosort: Waste Segregation System

Author: Sahil Padave, Jayesh Patil, Anish Karbhari, Vighnesh Koli

Project Guide: Jovita Serrao

Abstract: ECO SORT revolutionizes waste segregation specifically for electronic waste (E-Waste), heralding a new era in sustainability practices and efficient management of electronic discards. This cutting-edge system employs state-of-the-art technology to automate the sorting of diverse types of E-Waste, thereby optimizing recycling and disposal protocols. Through the fusion of artificial intelligence and sensor-based mechanisms, ECO SORT significantly diminishes human involvement and potential errors in E-Waste segregation processes. The overarching objective is to streamline waste management operations while safeguarding the integrity of segregation data pertaining to E-Waste. Leveraging intelligent sensors and robotics, ECO SORT seamlessly automates the segregation process, effectively distinguishing E-Waste from general waste streams. This innovative approach not only elevates the overall efficiency of waste management systems but also contributes profoundly to environmental sustainability endeavors. By reducing reliance on manual intervention and enhancing the accuracy of sorting, ECO SORT facilitates the reduction of the ecological footprint associated with improper E-Waste disposal practices, aligning with global initiatives aimed at fostering a greener and more sustainable future.

Acc.No: PR 2426/ EXTC568

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Handwritten devnagari word recognition using deep learning

Author: Shruti Shinde, Rutvi Shah, Kalpak Naik, Royston Dmonte

Project Guide: Kevin Noronha

Abstract: This study explores the application of deep learning in recognizing handwritten Devanagari words, a crucial aspect in automation systems. Devanagari script, prevalent in India, comprises 12 vowels and 36 consonants. The proposed method involves four key steps: segmentation, labeling, feature extraction, and recognition. Utilizing a convolutional neural network (CNN) for training, coupled with image processing techniques, the model accurately identifies characters and evaluates the segmentation and recognition accuracy. This research addresses the growing need for efficient handwritten word recognition systems, particularly in the context of the Devanagari script.

Acc.No: PR 2427/ EXTC569

LEARNING AND INFORMATION RESOURCE CENTRE

Title: DDoS Attack detection and mitigation in SDN using Machine Learning

Author: Asawari Lad, Rishikesh Vishwakarma, Chirag Jariwala, Gaurang Patil

Project Guide: Kevin Noronha

Abstract: Software Defined Networking (SDN) is a networking paradigm that has become increasingly popular due to its advantages over traditional networks in terms of scalability, flexibility, and its ability to address numerous security issues. However, SDN networks are vulnerable to new security threats and attacks. Distributed Denial of Service (DDoS) attacks pose a significant threat to SDN controllers.

To address this issue, we have proposed a model capable of automatically detecting and mitigating attacks in SDN networks using Machine Learning (ML). Our system consists of a detection module and a mitigation module. We implemented a network using Mininet and the Ryu controller and simulated network traffic, including normal and anomalous traffic. We extracted features such as source IP, destination IP, flow duration, ICMP type, idle time, and packet count from the packets using the Ryu controller application to create the dataset.

We evaluated and trained five ML algorithms, namely Logistic Regression (LR), Naive Bayes (NB), K-Nearest Neighbor (KNN), Decision Tree (DT), and Random Forest (RF), to detect and mitigate DDoS attacks.

Acc.No: PR 2428/ EXTC570

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Fire Fighting Robot

Author: Pratheesh Pillai, Durwank Roarane, Pratham Sawant, Aakash Dhuri

Project Guide: Savita Kulkarni

Abstract: With the increasing incidence of fires in both urban and industrial environments, the need for efficient and reliable firefighting solutions has become paramount. The design, development, and integration of a sophisticated firefighting robot equipped with multiple sensors, including the MQ-135 gas sensor, a high-resolution camera, and an ESP32 microcontroller. The objective of this robot is to provide a safer and more effective approach to fire detection and suppression while reducing human exposure to hazardous conditions. The MQ-135 gas sensor is employed to detect the presence of harmful gases, such as carbon monoxide, methane, and other combustible gases, within the fire-affected area. The data collected from the gas sensor is processed by the ESP32 microcontroller, allowing for real-time analysis and decision-making. This information is crucial for assessing the severity of the fire and optimizing the robot's navigation and fire suppression strategies. This represents a significant advancement in the field of fire safety technology, showcasing the potential for integrated sensor systems and remote-operated robotics to improve firefighting capabilities and reduce the risks associated with fire response activities.

Acc.No: PR 2429/ EXTC571

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Real Time Multilingual Sign-Speech Translation Application

Author: Mihir Jani, Meet Mewada, Aditya Mishra, Rachna Sanghvi

Project Guide: Gautam Shah

Abstract: In addressing the complexity of sign language translation and the challenge of comparing various methodologies, an implementation of a text-to-gloss-to-pose-to-video pipeline approach has been developed. This approach facilitates translation from German to Swiss German Sign Language, French to French Sign Language of Switzerland, and Italian to Italian Sign Language of Switzerland. The approach comprises three primary components: Text-to-gloss translation, which converts input text into a sequence of sign language symbols using a combination of lemmatization, rule-based word reordering and dropping, and a neural machine translation system. Gloss-to-pose conversion, which transforms glosses into a sequence of skeletal poses using a lexicon of sign language signs and skeletal poses extracted from videos. Pose-to-video generation, which renders skeletal poses into a video employing various techniques such as motion blending and interpolation. This open-source implementation is anticipated to enhance the accessibility and inclusivity of sign language translation while enabling researchers to compare methodologies more effectively and develop new and enhanced sign language translation systems.

Acc.No: PR 2430/ EXTC572

LEARNING AND INFORMATION RESOURCE CENTRE

Title: A Hassle-Free Smart Shopping Cart

Author: Kunal Ghagre, Dhvani Joshi, Aksha Kamble, Manish Dawade

Project Guide: Jayasudha Koti

Abstract: The Hassle-Free Smart Shopping Cart is designed to provide a seamless shopping experience for customers and to improve the overall experience for retailers. This shopping cart incorporates YOLOv5 for object detection, WebSocket's for data transfer and Razor pay Gateway Integration for billing, replacing traditional technologies like barcode detection and RFID systems. The smart shopping cart also features a navigation system using Mapped in, enabling easy store navigation. These technologies collectively save time for customers and enhance store management for retailers. This amalgamation of cutting-edge technologies not only saves valuable time for customers but also optimizes store management for retailers with improved inventory management and lower labour cost. This project sets a new standard for convenience, efficiency, and innovation in the retail industry.

Acc.No: PR 2431/ EXTC573

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Multilingual Text to Image AI Generator

Author: Nikhil Kumar Jaiswal, Jay Jha, Subhash Jha, Vinit Yadav

Project Guide: Quanitah Ajmal

Abstract: Bridging the gap between languages and images, this project proposes a Multilingual Text-to-Image Generation system that leverages the Google API Translation service to seamlessly translate text from multiple languages into a common language. The system utilizes the Stable Diffusion (SDXL 1.0) pre-trained model, fine-tuned with images from Dreambooth, an advanced image enhancement tool, to generate visually compelling outputs based on user prompts. By incorporating various enhanced models that capture different aspects of the visual domain, the system produces high-quality images, rich in details, textures, and artistic styles, effectively overcoming the language barrier and aligning with the intended meaning of text prompts. This project demonstrates the potential of multilingual text-to-image generation and opens doors for future advancements in creating visually appealing and linguistically diverse content.

Acc.No: PR 2432/ EXTC574

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Military Spying and Bomb Disposal Robot

Author: Melwin Kaitharath, Dhvani Desai, Rupesh Pal, Dharmank Patel

Project Guide: Shilpa Chaman

Abstract: This project is very beneficial in areas where there is a high risk for humans to enter. This system makes use of a robotic arm as well as a robotic vehicle which helps not only to enter an area involving high risk but also to pick whatever object it wants to. This project aims to enhance the safety and security of bomb disposal squads, considering the prevailing law and order situation in India and worldwide. Bomb technicians face life-threatening risks daily, with numerous personnel getting injured or losing their lives while defusing bombs. The primary objective of our robot is to offer an additional layer of protection to these squads by enabling them to inspect and analyze suspicious packages before physically approaching them for disposal. By delegating potentially dangerous situations to the robot, the bomb technician can focus on formulating appropriate strategies for handling explosive devices rather than being immediately exposed to life-threatening dangers. Even if the robot cannot directly disrupt an item, it can still play a crucial role in relaying valuable information to facilitate tool and procedure selection. Additionally, the robot's camera can capture vital events, serving as valuable evidence for subsequent analysis.

Acc.No: PR 2433/ EXTC575

LEARNING AND INFORMATION RESOURCE CENTRE

Title: Motion based musical instrument

Author: Tilak,Vaidya, Rohit,Vaidya, Preksha,Vartak

Project Guide: Gautam shah

Abstract: A motion-based musical instrument is an innovative creation that allows musicians to produce sound and music through physical movements. These instruments leverage motion sensors, accelerometer, and gyroscope to translate different types of movement into musical input. The above sensors are used to track the hand movement of users and it lets users change multiple octaves. It is used for switching between types of instruments. The input from sensors is passed through a micro-controller to the web server where the musical notes are assigned and mapped to the sensors. This idea combines music, technology, and interactive art, providing musicians new ways to express themselves and engage with music. This device provides users a platform that can embed multiple instruments of different categories such as string, keyboard, etc.

Acc.No: PR 2434/ EXTC576

LEARNING AND INFORMATION RESOURCE CENTRE

.Title: Deepfake Detection Using Neural Networks

Author: Sneha Mishra, Yash Nandoskar, Dhruv Patel, Darshan Shetty

Project Guide: Valentina Rani

Abstract: Deepfake refers to a type of artificial intelligence (AI) technology that uses deep neural networks to create highly realistic and often deceptive fake content, typically in the form of videos or images. Deepfakes can convincingly manipulate or replace the appearance and voice of individuals in video footage, making it appear as though they are saying or doing things they never did. As the capability to create highly convincing, synthetic content continues to evolve, it becomes increasingly essential to develop robust methods for detecting deepfakes. For our project we performed pre-processing techniques like face detection, image cropping and image resizing, later the pre-processed dataset was trained on the models MobileNet V2, EfficientNetB2 and B3. Out of the three trained models, MobileNet V2 achieved highest accuracy of 94.50 %.

Acc.No: PR 2435/ EXTC577