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Enhanced Classification of Diabetic Retinopathy via Vessel Segmentation: A Deep Ensemble Learning Approach

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Keywords:
diabetic retinopathy, vessel segmentation, deep ensemble learning, computer vision, DRIVE dataset, Canny operator, blood vessel segmentation

ABSTRACT

Diabetic Retinopathy (DR), a medical condition that impairs the blood vessels within the eye, is increasingly prevalent. Unchecked progression of DR can lead to significant visual impairment or total blindness. Traditional techniques for automatic DR detection, primarily reliant on computer vision systems, often fail to adequately encapsulate the inherent complexity of the disease, resulting in suboptimal categorization of DR stages, particularly the early ones. However, deep ensemble learning has emerged as a potent tool for the accurate detection and classification of DR using retinal images. In this study, deep ensemble models are proposed that initially segment the retinal image using the Canny operator and subsequently detect and classify all DR categories using the publicly available DRIVE dataset. Each model, crafted with subtle architectural distinctions or trained on distinct data subsets, was designed to capture varying disease attributes. A threshold was established to accurately categorize DR severity into mild, moderate, or severe cases. The results indicate a significant enhancement in the performance of both segmentation and DR detection through deep ensemble learning, compared to individual models. The ensemble approach effectively amalgamated the collective knowledge of the models, yielding superior accuracy, robustness to data variations, and improved generalization capabilities. This cost-effective computational method achieves an accuracy score of 98.65% in DR detection and classification. By synthesizing the predictions of multiple models, the ensemble captured a wider spectrum of disease patterns, thereby bolstering the system's overall effectiveness in DR diagnosis. The findings underscore the enhanced accuracy and robustness attained through the ensemble approach, surpassing the performance of individual models.

1. INTRODUCTION

Diabetic retinopathy (DR) stands as the leading cause of vision impairment among individuals aged between 30 and 55 years [1]. A staggering 90% of confirmed DR incidents could potentially be circumvented through adequate eye care and timely screening procedures [2]. Predominantly affecting long-term diabetes patients, DR alters the lens curvature, giving rise to visual disturbances, and ranks among the most severe ocular disorders [3]. Furthermore, DR emerges as a primary contributor to blindness, with its insidious progression rendering it treatable if identified at an early stage. However, delayed detection can inflict irreversible damage to the human retina, culminating in permanent blindness [4].

The onset of DR is attributed to alterations in the retinal blood vessels. The retina, a thin photosensitiv
rear of the eye, is vulnerable to elevated bloo
which can inflict damage on blood vessels
these vessels can thicken and leak, precipita
DR is generally categorized into four stages:
severe non-proliferative, and proliferative. Tl
the initial stage, known as mild non-prolife
manifestation of sac-like swelling in small sections of the retinal blood vessels [5, 6]. The condition progresses to the moderate non-proliferative stage when blockages occur in certain retinal blood vessels. The severe non-proliferative stage is marked by additional vessel blockages, depriving sections of the retina of adequate blood supply [7]. The final stage, proliferation, is characterized by the formation of new, yet unstable and distorted, blood vessels in the retina. These vessels may subsequently hemorrhage, potentially inducing total vision loss or blindness [8].

Routine retinal examinations of diabetic patients prove instrumental in the early detection of DR, thereby mitigating the risk of blindness. However, retinal screening is a time-intensive process that relies heavily on the expertise of ophthalmologists to dissect fundus images and examine retinal
1 illustrates images of a healthy retina
ıst a DR-afflicted retina. Diabetic eye disease
wo stages: Non-Proliferative Diabetic
DR) and Proliferative Diabetic Retinopathy

ealthy progression of DR, often remaining
vision loss transpires, timely intervention is

learning using fundus images: A survey. IEEE Access, 8: 151133-151149. https://doi.org/10.1109/ACCESS.2020.3015258

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NOMENCLATURE

DR	Diabetic retinopathy
NPDR	Non-Proliferative Diabetic Retinopathy
PDR	Proliferative Diabetic Retinopathy
CNN	Convolutional Neural Networks
DNN	Deep Neural Network
TP	True Positive
TN	True Negative
FP	False Positive
FN	False Negative

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The Impact of Generative Content on Individuals Privacy and Ethical Concerns

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Abstract: The rise of AI and ML-fueled generative content technologies has altered every stage of the content life cycle, from creation to distribution to consumption. There are many positive outcomes from these breakthroughs, but there are also serious ethical and privacy problems. The purpose of this work is to investigate the wide-ranging effects of generative content on personal data security and ethical considerations. The article dives into the privacy concerns that may arise from using generative material. Since this kind of technology depends heavily on user data, the ease with which accurate and tailored content may be generated raises concerns about data privacy. Unauthorized content synthesis, which may lead to the proliferation of bogus data, counterfeits, and other types of illicit tampering, is also a source of worry. We have attempted to consider all these implications and delve into them to bring out possible solutions. We are optimistic that this article will provide future insights into the research of generative content and its ethical considerations.

Keywords: *Images, videos, generative AI, ethical, privacy*

1. Introduction

Generative AI, an abbreviation for "Generative Artificial Intelligence," is a subset of AI approaches that uses a ML model to produce new material including text, pictures, audio, and video [1-2]. Generative AI, in contrast to more typical AI systems, is meant to develop imaginative and imaginative outputs that frequently mirror or emulate human-generated material, rather than relying on preexisting data to make choices or categories. In order to generate fresh material that is both cohesive and culturally important, creative AI models may learn designs and frameworks from enormous datasets [3-5]. Many of the models mentioned are constructed on top of DL architectures like RNNs, CNNs, and, more recently, transformers. Over the last two years, several big generative models have been released, including ChatGPT and Stable Diffusion. To be more specific, these models are transforming a number of different fields by doing things like automatically making creative pictures and answering general questions. Therefore, these generative models have far-reaching consequences for the business and society at large, since they may lead to the elimination of various employment categories [6-9]. Generative AI can convert text to images using models such as DALLE-2, text to 3D images using models such as Dream fusion, images to text using models such as Flamingo, text to video using models such as Phenaki, text to audio using models such as AudioLM, text to other texts using models such as ChatGPT, text to code using models such as Codex, text to scientific texts using models such as Galactica, and so on. This effort aims to classify the most important recently released generative models and offer a brief description of the key industries impacted by generative AI [10-11]. Appropriate study, creation, and implementation of AI systems need careful consideration of their moral consequences. As AI develops and finds more applications in our daily lives, it raises a number of moral and social problems. Important ethical problems in artificial intelligence as depicted in Fig.1. This information is acquired from [12].

Prejudice: Artificial intelligence may or discriminating material if it is taught

ıtion: Because of the prevalence of AI-ial, it might be difficult to tell fact from

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"Psychological Confidence by Ai: Enhancement Quality & Future of Mobility for People with Disabilities of Neurological Impairment"

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Abstract: Artificial intelligence (AI) has been viewed primarily a public benefit since it is used by more than four billion individuals every month. Individuals of all abilities are welcome to use it. Mobility is greatly aided by technological advancements, especially those involving AI. To enhance the quality of life of a certain group of individuals, it's not enough simply to discover cutting-edge ideas; rather, an answer must be put at their fingertips. For the more than a billion handicapped individuals across the globe that potentially benefit from AI, this would be a huge step forward. In this work, we attempt to bring forward the recent advancements in computational intelligence methods and how AI might improve access. We hope that this work will be a lay a foundation for the researchers to work in this domain in the near future.

Keywords: Disability, AI, mobility, recognition, intelligence, ease of life.

1. Introduction

The term "artificial intelligence" (AI) is used to describe technological advancements that mimic human intellect. It encompasses technological solutions that are capable of playing chessboard and solve calculations like a person to those which can replicate cognitive ability in other ways. A particular aspect of artificial intelligence is machine learning (ML), which allows computers to develop via exposure to additional information in attempt to more accurately forecast users' demands. AI and ML have the potential to greatly improve the lives of persons with disabilities by facilitating the development of new intellectual and technology products and procedures [1]. Google, for one, employs ML by having its systems track people' browsing habits and social media likes so as to tailor its service to each individual person [2]. One must discuss the moral difficulties posed by the intersection of artificial intelligence and impairment. For this, we will rely on anecdotal evidence, within the context of publications as two persons with disabilities, to examine the potential, support, and challenges of using AI as part of one's everyday life [3-5].

This work emphasis on recent advancements in computational intelligence methods and how AI might improve access to the disabled people in their

2. Comparative Study

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E-learning Gaming website using Artificial intelligence [A Literature Survey]

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Abstract:

The project "E-learning Gaming Website" aims to create an innovative online platform that combines the elements of interactive gaming with the power of Artificial Intelligence (AI) to enhance the e-learning experience. The website will host a diverse collection of 5-6 educational games tailored to different subjects and learning levels, catering to students of all ages. The proposed platform leverages AI technologies to create dynamic and adaptive gaming experiences for users. Each game will be designed to educational and amusing content, ensuring that users not only have fun while playing but also acquire knowledge and skills relevant to their academic curriculum. The development process begins with a comprehensive analysis of the target audience and educational requirements. This step helps in designing games that align with specific learning goals, curriculum standards, and cognitive abilities of the users. The incorporation of AI-driven algorithms enables the games to adapt to individual user performance, providing and feedback.

Decentralized Identity Management using DevOps and Blockchain: A Comprehensive Integration

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ABSTRACT

This research paper investigates the integration of DevOps methodologies and blockchain technology to develop a decentralized identity management system. In response to the challenges of centralized identity management, the study aims to enhance security, privacy, and operational efficiency. The paper reviews existing literature on decentralized identity management, DevOps, and blockchain, identifying gaps and proposing a novel synthesis of these domains.

The research proposes a comprehensive theoretical framework, outlining the foundational principles of decentralized identity management, DevOps practices, and the role of blockchain in securing digital identities. Through detailed examinations of system architecture, implementation strategies, testing methodologies, and security measures, the paper presents a holistic solution. By seamlessly incorporating DevOps into the development lifecycle and leveraging blockchain's inherent security features, the proposed decentralized identity management system not only addresses current vulnerabilities but also sets the stage for a more secure and user-centric digital future.

Keywords: DevOps, Blockchain Technology, Digital Identity, Security, Privacy, Decentralization, DevSecOps, Continuous Integration, Continuous Deployment, Smart Contracts, Blockchain Integration, Identity Verification, Automation, Infrastructure as Code (IaC), Testing Framework, Security Practices, User-Centric Identity, Scalability, System Architecture

1. INTRODUCTION

1.1 Background:

In the rapidly advancing landscape of digital ecosystems, the traditional centralized model of identity management grapples with escalating challenges, ranging from security vulnerabilities to privacy concerns. In response to these pressing issues, this research embarks on a pioneering exploration at the intersection of DevOps methodologies and blockchain technology, envisioning a comprehensive solution for decentralized identity management. As our digital interactions burgeon, the need for a resilient, secure, and user-centric identity management system becomes more imperative than ever.

The conventional approach to identity management, often centralized and reliant on single points of authentication, exposes users to an array of risks, including unauthorized access, data breaches, and the potential compromise of sensitive information. Decentralized identity management represents a paradigm shift by dispersing control and trust, promising heightened security and privacy. This research seeks to bridge the realms of DevOps and blockchain, recognizing their symbiotic potential to revolutionize ide

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Psychology Behind Gamification

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Abstract: The main aim of gamification, i.e. the implementation of game design elements in real-world contexts for non-gaming purposes, is to foster human motivation and performance in regard to a given activity. Previous research, although not entirely conclusive, generally supports the hypothesis underlying this aim. However, previous studies have often treated gamification as a generic construct, neglecting the fact that there are many different game design elements which can result in very diverse applications. Based on a self-determination theory framework, we present the results of a randomized controlled study that used an online simulation environment. We deliberately varied different configurations of game design elements, and analysed them in regard to their effect on the fulfilment of basic psychological needs. Our results show that badges, leaderboards, and performance graphs positively affect competence need satisfaction, as well as perceived task meaningfulness, while avatars, meaningful stories, and teammates affect experiences of social relatedness. Perceived decision freedom, however, could not be affected as intended.

Key Words :
E-learning, Gaming website, Artificial Intelligence (AI), Interactive, Educational games, Subjects, Learning levels, Target audience, Curriculum standards, Cognitive abilities, Adaptive gaming experiences, Personalized challenges, Machine Learning algorithms, User interactions, Progress tracking, Recommendation system, User preferences, User registration, User engagement, Learning outcomes, User satisfaction, Game development frameworks, AI libraries, Website interface, User-friendly, User feedback, Performance metrics, Digital age.

I. Introduction

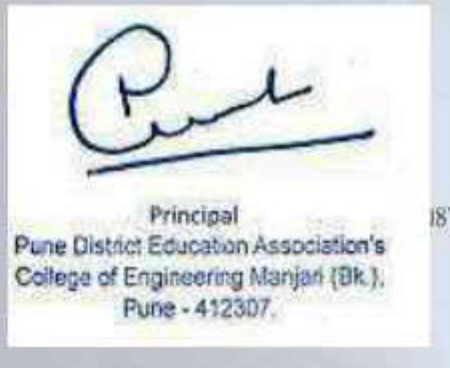
The realm of e-learning has undergone a remarkable transformation in recent years, driven by the convergence of innovative technologies and a growing understanding of effective learning methodologies. Among these advancements, gamification and artificial intelligence (AI) have emerged as powerful tools for enhancing engagement, tailoring learning experiences, and optimizing educational outcomes.

Gamification, the application of game-design elements to non-game contexts, has proven to be a potent force in e-learning. By incorporating game-like mechanics, such as points, badges, leaderboards, and challenges, e-learning platforms can foster a sense of motivation, competition, and achievement, making the learning process more enjoyable and effective.

AI, on the other hand, has revolutionized e-learning by enabling personalized learning experiences. AI algorithms can analyze vast amounts of data, including student behavior, performance metrics, and learning styles, to create customized learning paths that cater to each individual's needs and preferences. This personalized approach ensures that learners receive the most relevant and effective instruction, maximizing their learning potential.

II. Background

E-learning games, also known as educational games or serious games, are video games that are designed to teach or train players. They can be used to teach a wide variety of subjects, from math and science to history and language arts. E-learning games can also be used to train employees on new software or procedures.



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Stress Analysis using Feature Extraction Approach Using EEG Signal

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Submitted: 20/09/2023 **Revised:** 25/10/2023 **Accepted:** 11/11/2023

Abstract: Individuals experience stress in every society. Work-related concerns, disappointments, poor working conditions, etc., are prevalent worldwide sources of stress. Stress can be useful in the short term. However, chronic stress has serious consequences for health, including an increased risk of cardiovascular problems like heart disease, hypertension, and stroke. Mood and personality disorders including depression and anxiety are also possible outcomes. Therefore, the ability to recognise stress is useful for managing the health problems stress might cause. Stress can be measured and evaluated dependant on perceptual, behaviour and physiological reactions. Using feature extraction and classification methods, a few scholars have developed alternative approaches. It is based on that some of these procedures are intricate in their applicability and they produce less precise findings in human stress analysis. Therefore, a trustworthy and exact system is required. The goal of this study is to use Electroencephalography (EEG) signals to identify stress in real time, with the ultimate goal of creating a more accurate and trustworthy system. Stress can be reliably measured in a noninvasive manner with the help of EEG signals. To improve the accuracy of classification in stress detection, in this study, have been employed for feature extraction to extract significant time-frequency features. Accurate classification relies heavily on the selection of the best suitable feature extraction method. Equipment for acquiring EEG signals is used to validate the designed system.

Keywords: *Signal processing, Brain-Computer Interface (BCI), Electroencephalography (EEG), Stress detection.*

I. Introduction

According to the field of psychology, "stress" refers to a "strain and pressure" combination. Stress can be helpful and even beneficial in little doses. High blood pressure, cardiovascular disease, heart attack, and stroke are only some of the health problems that can be triggered by stress in excess. Mental health is also affected, including anxiety, depression, and personality disorders. Psychological, physiological, occupational, and biomechanical indicators all provide unique insights into the effects of stress. Electroencephalogram (EEG) signal analysis for the diagnosis of stress is a valuable medical diagnostic tool. Electroencephalogram (EEG) readings quantify the relationship between brain activity and physiological responses in the brain's major organ, the brain. EEG has been utilised for decades in the study of human stress regulation and treatment in the field of neuroscience. Based on the literature, we can infer that more specialised expertise in the BCI sector is necessary for putting into practise brain-computer interaction systems. When analysing an EEG signal, a ratio of the spectral power to the spectral centroid is chosen as a feature for a K-nearest neighbour classifier. The author examines stress detection using physiological signals and demonstrates how HCI might be improved as a result. It has described the link of brain signals with stress detection model by classifying human stresses. The international affective pictures and system (IAPS) [3] was used to show the subjects in the stress detection procedure audio and visual stresss stimuli. To classify the data, the authors of [4] use a multi-layer perceptron (MLP) after using the kernel density estimation (KDE) method to extract features from the signals. There are four main types of stress that can be identified: sadness, fear, happiness, and serenity. Researchers have utilised a variety of machine learning and deep learning methods to analyse EEG signals and identify features useful for cla

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Create an Innovative Intrusion DetectionSystem for the Internet of Things by Improving Feature Weighting Through Heuristics

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Submitted: 04/12/2023 **Revised**: 14/01/2024 **Accepted**: 25/01/2024

Abstract: Recently, the "Internet of Things (IoT)" industry has developed as a tool for developing intelligent models of operation. Real-world applications that rely on the IoT system view privacy and security as major issues. Security issues in IoT-enabled devices pose obstacles to progress in the smart economy. As a result, "Intrusion Detection Systems (IDSs)" tailored to the IoT industries are desperately needed to curb the escalating number of attacks based on the Internet of Things. Because of their limited processing power, memory size, and battery life, traditional IDSs cannot be used in broad IoT-aided networks. Several IDSs have been proposed in academic publications as potential solutions to these issues. However, many IDSs run into problems with false positives and false negatives when looking for anomalies. In order to detect intrusion in the IoT industry and fix the problems with traditional systems, a deep learning ensemble model is suggested. In the first stage, we obtain the raw data from established sources. Consequently, the model is verified using complementary metrics. The proposed approach, on the other hand, not only overcomes the greater detection rate, but also aids in avoiding intrusion from third parties.

Keyword: *Ensemble Networks, IoT Intrusion Detection Systems, and the Internet of Things.*

1. Introduction

The term "Internet of Things" (IoT) is used to describe the global network of electronic devices that can gather and share data through the use of built-in sensors, processors, and network connections. While there are many upsides to the Internet of Things, there are also some security concerns. Protecting Internet of Things (IoT) infrastructure from threats like hacking, data breaches, and other hostile actions relies heavily on intrusion detection systems. In order to identify security threats, intrusion detection systems (IDS) analyse data from all devices and traffic on a network. Due to resource limits, heterogeneity, and changing topologies in IoT networks, traditional IDS approaches generally fall short in IoT contexts. Due to its ability to automatically learn complicated patterns and features from massive volumes of data, deep learning has emerged as a potential solution for intrusion detection in IoT. In order to detect intrusions in the Internet of Things using deep learning, artificial neural networks are trained to examine data from sensors and other sources. Deep learning models can detect anomalous behavior, identify attempted intrusions, and categories threats by learning from past data. In conclusion, deep learning-based intrusion detection in the Internet of Things has considerable potential to strengthen IoT network and device security. As research and development in this area proceeds, it will likely play an increasingly important role in safeguarding the security, confidentiality, and privacy of Internet of Things (IoT) infrastructure.

There are a number of obstacles specific to intrusion detection in the IoT that must be overcome to assure adequate safety. The limited processing power, memory, and energy resources of many IoT devices is just one of the major obstacles. It can be difficult to implement resource-intensive intrusion detection algorithms on such devices. To get beyond these restrictions, effective methods like slimmer models or distributed computing need to be created. The devices that make up an IoT network can be made by a number of different companies and run a wide variety of software and communication protocols. Due to the wide variety of devices and communication protocols, it is challenging to create a unified intrusion detection system. For successful intrusion detection across various IoT devices, it is necessary to solve

compatibility and interoperability difficulties. Adversarial assaults, in which an attacker manipulates input data to trick the detection model, can compromise deep learning-based intrusion detection systems. False negatives and false positives caused by malicious attacks weaken an IDS's ability to p[illegible] problem to create deep lea[illegible]

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ORIGINAL CONTRIBUTION

Investigating the Mechanical Aspects of Natural Fiber-Based Structural Composite for Hybrid Energy Storage Applications

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Abstract Current energy storage devices are delicate, hold limited capacity, and struggle to achieve maximum energy conversion efficiency. While breakthroughs are unlikely in the near future, advancements can come from either exploring new materials or integrating with existing systems. We propose a novel approach: a hybrid material development for a hybrid mode of energy storage, never before seen in the scientific community. This work investigates the feasibility of this system by examining the mechanical properties of a prototype hybrid composite, paving the way for future exploration of its broader potential in mechanical, thermal, electrochemical, and microstructural aspects for energy storage applications.

Keywords Sustainable energy · Energy storage and conversion · Energy harvesting · Mechanical properties · Natural fibers

Introduction

Achieving clean energy and a pristine environment are cornerstones of the United Nations Sustainable Development Goals, paving the way for a world free from poverty and brimming with ecological health [1, 2]. However, seamlessly interweaving these two pillars remains a formidable challenge for the scientific community. While extensive research exists on both energy storage and environmental remediation, a gap persists in integrating these crucial spheres [3–5].

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Deflection Prediction of an Anti-vibration Mount by Finite Element Analysis

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chloroprene rubber, finite element analysis, anti-vibration mount, rubber deflection prediction

ABSTRACT

To ensure the safety and dependability of rubber components, deflection analysis and prediction play a crucial role in process of design. Material property testing and finite element analysis (FEA) are combined to forecast the maximum deflection of a railway elastomeric pad. IRMRA (Indian Rubber Manufacturer's Research Association) developed the chloroprene rubber. Using the FEA method, maximum deflections of an anti-vibration mount under several compressive loads are calculated. Mooney-Rivlin nonlinear hyperelastic three parameter model with element type Plane 182 is used for and FEA. Curve fitting of the uniaxial tensile test results is used to extract three parameter Mooney-Rivlin model constants by using FEA. Then, these Mooney-Rivlin model constants are used to analyze anti-vibration mount and predict the deflections at different compressive loads. The outcomes are contrasted with the technical specifications provided by the Research Designs and Standards Organization of Indian Railway and predicted deflections are within the limits of maximum values allowed. The results are also contrasted with data from literature, and 10% variation is observed between results obtained and literature results. This methodology can be used to predict deflections of any newly developed rubber at initial stage of design.

1. INTRODUCTION

Due to their vast elastic reversible deformation, absorption of energy, and superior damping properties, rubbers are commonly used in a variety of applications. Standard uses contain mounts for engine and automobile tires, electric appliances for household, bridge rubber bearings, and vibration isolators for railroad wagons. The majority of these rubber parts are loaded both statically and dynamically while in use. One of the most important considerations in rubber parts design is operational problems prevention [1]. To ensure the security and dependability of mechanical rubber components, analysis of deflection and strength estimation are crucial steps in the process of design. Bench compressive tests, road simulation tests, and real road tests have been the main methods used to evaluate the compressive strength of rubber components [2]. The compressive strength test should always be performed anytime a material or geometri made, even though these approaches have adv of accurate compressive strength estimation rubber parts design requires estimation strength which will be obtained by tests o analysis of parts [3]. In this study, a established to forecast the deflections of railw mount under various loads with the help of tests of material property and FEA modeling. The objective of this work is to predict the deflection of an anti-vibration mount at different compressive loads before manufacturing the actual rubber mount which will helpful at early design stage. If the deflections of the mount are within the permissible limits, then only the life and working of mounts will be satisfactory. On the investigation and material characterization of rubber, there is a wide body of literature. The section that follows discusses some of the work.

Yeoh [4] addressed the unique characteristics of the rubber Ogden strain-energy function material model, which is starting to gain traction among finite element analysis users. It illustrates why an Ogden strain-energy function produced by nonlinear regression analysis of stress-strain data derived from just one mode of deformation may be unsuitable for forecasting behavior in other deformation modes. It advises e coefficients in the regression analysis be lance with the behavior of rubbery materials. s fatigue life was predicted by Li et al. [5] by and property tests of material. Uniaxial tensile life tests of natural rubber were used for life equation of materials like natural rubber. cipate the rubber mount's fatigue life, total

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Performance Assessment of Petrol Engines with Hydrogen as an Alternative Fuel

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Keywords:
petrol engine, hydrogen, alternative fuel, performance characteristics, pollutants, mechanical efficiency, brake thermal efficiency, data storage system

ABSTRACT

This research focused on reducing emissions from petrol engines to mitigate greenhouse gases. Experiments aimed to decrease pollutants from petrol engines and enhance efficiency at full load using hydrogen as a secondary fuel, injecting it for 2 milliseconds and 2.5 milliseconds. The study comprised two phases: one using petrol alone at all loads, and the other combining petrol with hydrogen injections at 216 gm/hour and 270 gm/hour. Performance, pollutants, brake, and mechanical efficiencies were compared between phases. Efficiency gradually improved with load for the 2ms injection. Efficiency improved in all timing cases with hydrogen compared to running on petrol alone. The highest efficiencies occurred with 2.5ms hydrogen injection, reducing pollutants at full load, making it the optimal interval. Injecting hydrogen in petrol engines improves efficiency by reducing emissions. Injecting hydrogen at 270 gm/hour at full load increased brake and indicated thermal efficiency by 9%, with no change in mechanical efficiency compared to pure petrol, which was slightly higher. Emissions of NO, CO_2, and HC were reduced by 16.5%, 15%, and 17.2% respectively. Oxygen percentage by volume increased by 10.43%, supporting complete combustion.

1. INTRODUCTION

The energy demand is increasing day by day with the increase of the world population. Due to this, it not only reduces current energy reserves but also increases energy losses. Due to the determinate potential of oil reserves, it is necessary to increase the use of alternative fuels. The use of hydrogen in combination with petroleum-derived fuels in internal combustion engines can reduce harmful exhaust emissions from fossil fuels. Therefore, researchers continue to work for an economic and safe fuel that does not harm the environment.

Ravi et al. [1] modified single-cylind ignition engine to work as lean burn spark igni run on LPG and substitute hydrogen for o: compression ratios were used for keeping th and observed that for high compression rati were found less when combined with h compression ratio 10.5:1 as optimal. The brak and brake thermal efficiency were increased. At lower loads the thermal efficiency was reduced. By adding hydrogen, the combustion rate was enhanced. The emissions of carbon monoxide, carbon dioxide and NO were reduced considerably. Jain et al. [2] assessed the effect of split fuel addition and EGR on PCCI combustion, the study tested different start of main injection and pilot injection timings as well as EGR rates. The findings suggest that the best injection timing and EGR rate combinations can optimize PCCI combustion. Patil et al. [3] conducted a test using oxy hydrogen (HHO) in a spark ignition engine to understand the performance. HHO gas was generated by the electrolysis of water with KOH solution as allowed it to mix with a fresh stream of air of the carburetor. The generation of gas was rying supply of current. The Author observed easily integrated with spark ignition engine. rolled the flow of HHO with 9Amps current xperiment. It was observed that the engine s improved with on the introduction of HHO

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Enhanced Detection of Diabetic Retinopathy Using Ensemble Machine Learning: A Comparative Study

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Keywords:
machine learning, ensemble learning, deep learning and retinopathy in diabetics, deep convolutional neural networks (DCNNs), Messidor dataset

ABSTRACT

Diabetic Retinopathy (DR), a microvascular complication, stands as one of the leading causes of vision impairment among diabetic populations globally. This pathology is characterized by the occlusion of retinal vessels, thereby depriving the retinal tissue of essential nutrients. Given the progressive nature of DR and its potential to culminate in irreversible blindness, timely and accurate diagnosis is paramount for effective intervention. Conventionally, the detection of DR relies heavily on the expertise of ophthalmologists, a resource-intensive process that may be prohibitive in terms of cost and time. To address these limitations, automated detection systems have been developed, aiming to hasten diagnostic processes and democratize access to these crucial services. Nevertheless, the performance of such systems has been historically hampered by the scarcity of reliable data sources and medical records for this condition. In response to these challenges, this study explores an ensemble machine learning approach that synergizes multiple established classifiers into a cohesive diagnostic model. The proposed methodology demonstrates superior performance in accuracy compared to prevalent classification algorithms. Utilizing the Messidor dataset, the top-performing five and ten features were isolated into four sub-datasets through InfoGainEval and WrapperSubsetEval methods. The accuracy achieved for the top five features via InfoGainEval was 70.7%, while for the complete feature set, it reached 75.1%. The employment of ensemble machine learning techniques in diagnosing DR represents a significant application of artificial intelligence within the medical domain, conferring advantages such as enhanced accuracy, robustness, efficient feature selection, early detection, scalability, and a reduction in human error, all while ensuring cost-efficiency and enabling continuous monitoring for improved patient outcomes. However, the approach is not without limitations. These include the quantity and quality of data, clinical variability, ethical and privacy concerns, scalability challenges, potential overfitting, intricate feature selection and engineering, bias in data collection, and issues related to cost and accessibility. The findings underscore the efficacy of the sub-datasets, which facilitate a less cumbersome classification process as compared to the full Messidor dataset, thereby streamlining the diagnostic pathway.

1. INTRODUCTION

Diabetic Retinopathy (DR), a major microvascular complication of diabetes mellitus, manifests as damage to the retinal vasculature, resulting in characteristic macular changes such as exudates, aneurysms, and hemorrhages. The earliest recorded observation of macular anomalies in diabetic patients can be attributed to Eduard Jaeger in 1856. However, the definitive correlation between these anomal was not established until 1872 when J. histopathological evidence of retinal destruct cystoid processes in diabetic individual Diabetic Retinopathy was first identified by V 1876, marking a significant advancement in tl of DR [1].

Symptoms of DR, as described by the Mayo Clinic [2], often include vision spots, fluctuating visual acuity, chromatic aberrations, and in severe cases, complete vision loss in one or both eyes. These manifestations are the result of progressive occlusion of the retinal microvessels, which are essential for the nourishment of the retina. Consequently, automated diagnostic methods for detecting diabetic retinal damage are increasingly recognized as critical. While deep learning yielded high accuracy in binary classifications :acy in multi-class categorizations, especially :ease diagnosis, remains suboptimal.

/ for expedited clinical assessments and derscored by factors such as high patient :mergent care scenarios. Furthermore, the rdable treatment is a fundamental healthcare

Real Estate Booking System using Blockchain Technology

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Abstract - Real Estate Management in India as well as in many parts of the world is a very inefficient and insecure process. Developing a secure system that not only accelerates the process of land registration but also makes it efficient and secure will be effective. Blockchain technology is one of the latest and secured technologies on the horizon and has evolved over the last 9-11 years. There is tremendous potential for usage of Blockchain technology in the land industry. This paper presents a blockchain powered real estate management system that will impart transparency, efficiency, and security in Real Estate Management. The decentralized data storage application and its interactions with Ethereum Virtual Machine (EVM) are presented to point out the event of a sensible contract which will be used for blockchain smart contracts in real estate management. Further, a detailed design and interaction mechanism are highlighted for the estate owners and users as parties to a sensible contract. It will store all the transactions on a distributed blockchain which will be very secure and will not be prone to hacking. A list of functions for initiating, creating, modifying, or terminating a sensible contract is presented and this will help the user enjoy a more immersive, user-friendly, and visualized contracting process, whereas the owners and real estate agents can enjoy more business and sales. It is a practical solution to the real estate management problem in the real world.

Key Words: Blockchain, Smart Contracts, Real Estate Management, Ethereum Virtual Machine, Transparent Contracting Process

1.INTRODUCTION

Traditionally, we depend on trusted third parties to register and transfer the power of land and real estate property. This model poses several problems. Documents are frequently non digitized, hard to reach, even harder to update, and occasionally lost in time. Blockchain technology is an innovative way of keeping records digitally. Blockchain aims to reduce the threat for corruption and fraud of records by enforcing decentralization. Decentralization means the records are kept within the blockchain without the need for a central authority. In other words, the information stored in the blockchain is kept by everyone, making nearly impossible to falsify.

2. Body of Paper

A. Problems in the Current System

Real Estate Management in India as well of the world is a very inefficient and insecure current system, the buyer has to first pay the m and then has to pay the stamp duty charges to This process can be done offline as well as onl them have to schedule an appointment with the local sub-registry office where they have to be present on a given date and time with all the documents along with the payment proof. Their documents are verified and this process takes too much time and many loopholes are there which are beneficial for criminals. After this process, the buyer has to manually go to municipal offices to change owner details in the municipal records. There are Increasing numbers of fraud cases due to the non-availability of genuine data records to property buyers and a lack of transparency is in the system. It is all due to the fact that is data being unavailable in the public domain as well as there's no way to retrieve the number of properties owned by a person because the records are distributed. The government addressed this problem in the near past but the problem persists that, non-availability of genuine real data in the public domain and issue still needs to be addressed and this can be considered as a limitation or drawback of the system. This process consumes lot of time and involves middlemen and third-party people who charge illegal fees to do the work. They rob many innocent people who are unaware of the process. This process takes more than 10-15 days which should be done rapidly in this digital fast-moving world. Now the government has moved towards digitalization and making records available digitally in a centralized database. But loopholes are there with the centralized databases. Some of the issues include data security and fraudulent data changes which are serious problems to focus upon. Loss of records in any disaster situation if present in traditional offices or in a centralized system is another issue.

This system costs very high and it involves many people unnecessarily as in this digital world with the help of technology entire work can be automated. Apart from all these problems, there is another problem with the transfer of property by heredity or will. In this case, one has to go to the land sub-registry office with the death certificate of the person to transfer the property and so many procedures are needed to be followed in this case which is a very tedious procedure. There is not a single way to automatically transfer the property which should be implemented. One other problem is with financial institutions that they can't verify easily the property status in case of

rtgaged for the loan. Even if the property is on

ged there is no way for other persons to know

Vork

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tem based on Blockchain by A. Mittal: He has

Milk quality prediction and yogurt fermentation analysis using Machine Learning

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Abstract - The dairy industry plays a vital role in the global economy, with milk and dairy products being essential for human nutrition. Ensuring the quality of milk and its products is paramount for both consumers and producers. This study presents a novel approach to enhance milk quality prediction and optimize yoghurt fermentation processes using advanced Machine Learning (ML) techniques. An integrated system was developed, incorporating sensors, data processing units, and ML models, enabling automatic adjustments to the fermentation process in response to real-time data inputs. This not only enhanced the quality of the yoghurt but also increased production efficiency and reduced wastage significantly. The findings of this research demonstrate the potential of Machine Learning in revolutionizing the dairy industry. By leveraging predictive analytics and real-time data analysis, this approach ensures higher milk quality and more efficient yoghurt fermentation processes. Implementing these techniques at scale could lead to substantial improvements in dairy product quality, cost-effectiveness, and overall sustainability in the dairy industry.

Key Words:- Milk quality prediction, Yoghurt fermentation analysis, Machine Learning, Dairy industry, Dairy product quality, Deep learning, Predictive analytics, Real-time monitoring, Sustainability, Production efficiency.

1.INTRODUCTION

Milk quality prediction and yogurt fermentation analysis are vital aspects of the dairy industry, contributing to the production of safe and consistent dairy products. Milk serves as the primary raw material for dairy products like yogurt, cheese, and butter, making its quality a critical factor in the final product's characteristics. Similarly, the fermentation process plays a pivotal role in transforming milk into yogurt, affecting its flavor, texture, and nutritional content. The integration of modern technolog and scientific understanding has revolutionize processes, ensuring higher product quality, sa efficiency.

2. KEY ASPECTS OF MILK & YOGURT FERMENTATION DETECTION PROJECT

Key aspects of a Milk and yogurt Fermentation Detection Project, as outlined in the provided information, included:

ASPECT 1: Significance in the Food Industry Milk and yogurt detection using machine learning is essential in the food industry, particularly for quality control and food safety.

ASPECT 2: Differentiation Challenge The primary challenge is accurately distinguishing between milk and yogurt, which is crucial for quality control, contamination prevention, and ensuring product authenticity.

ASPECT 3: Data Collection A diverse and comprehensive dataset of images, spectroscopic data, or chemical properties of both milk and yogurt is collected. **ASPECT 4: Data Preprocessing** The collected data is pre-processed to remove noise, standardize data format, and ensure consistency across the dataset.

ASPECT 5: Machine Learning Algorithms Various machine learning algorithms are employed, including support vector machines (SVM), random forests, and deep learning models like Convolutional Neural Networks (CNNs).

ASPECT 6: Motivation The motivation behind this project is to improve product quality, perfect processes, ensure consumer safety, and drive innovation in the dairy industry through data-driven insights.

ASPECT 7: Efficiency and Sustainability The project aims to lead to more efficient, sustainable, and competitive dairy production practices.

ASPECT 8: Quality Prediction One aim is to develop a machine learning model to predict the quality of milk based on various parameters.

ASPECT 9: Fermentation Analysis The other aim is to employ machine learning techniques to analyze and perfect the yogurt fermentation process.

ASPECT 10: Multidisciplinary Approach Success in these aims requires a combination of domain ability, data l advanced machine learning techniques.

teal-time Detection Implementing a system ting the presence of milk and yogurt in real- n production lines, dairy farms, or retail a key aspect of the project.

his project combines domain knowledge, data advanced machine learning to address the

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Decentralized Cloud Storage: A Rusty Symphony of Security and Scalability

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ABSTRACT

In an era marked by rapid digital transformation, the imperative for secure, private, and scalable decentralized cloud storage solutions has become paramount. This research introduces a pioneering approach to address limitations identified in a reference paper, specifically focusing on challenges during implementation, scalability issues, vulnerabilities in smart contract-based transactions, and risks associated with IPFS for decentralized file storage. Leveraging blockchain technology, the InterPlanetary File System (IPFS), and the Rust programming language, our work aims to redefine the landscape of cloud storage.

Motivated by the need to establish true data ownership and mitigate vulnerabilities in centralized architectures, this research sets forth comprehensive objectives. We delve into an extensive literature review to bridge existing knowledge gaps, informing the enhancements introduced. The proposed improvements encompass a meticulous resolution of implementation challenges, advancements in scalability through adaptive scheduling algorithms and credit systems, optimization of smart contract-based transactions for enhanced security, and fortification of IPFS integration.

The significance of our work lies in the transformative potential of an enhanced decentralized cloud storage system. By identifying and rectifying existing limitations, our research not only contributes to the immediate discourse on decentralized technologies but also establishes a robust foundation for the evolving landscape of secure and user-centric cloud storage solutions.

Keywords: Decentralized Cloud Storage, Blockchain, IPFS, Rust, Data Ownership, Privacy, Security, Smart Contracts

1. INTRODUCTION

1.1 Background:

In an era marked by unprecedented digital transformation, the demand for secure, scalable, and decentralized cloud storage solutions has become in Conventional centralized cloud stora inherent challenges related to data ownership, privacy, and security, prompting the exploration of innovative approaches. The amalgamation of blockchain technology, the InterPlanetary File System (IPFS), and the Rust programming language represents a promising avenue for addressing these challenges and revolutionizing cloud storage paradigms.

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ORIGINAL RESEARCH ARTICLE

Introduction of machine learning with applications to communication system

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ABSTRACT

This research paper presents a brief introduction to the key point of Machine Learning (ML) with the application to communication systems. Due to the exceptional accessibility of software and data abilities, there is a great deal of interest in using digital information machine learning thinking to solve issues in a variety of fields. Regarding the phenomenal amount of information and computer facilities, there is a lot more interest in using content-supervised learning methods to resolve obstacles where engineering course techniques are restricted by theoretical or methodological problems. This study starts by clarifying when and why comparable strategies may well be effective. It then goes into the fundamentals of supervised and unsupervised at a high level. Where traditional engineering solutions are being developed Modelling or algorithmic flaws are posing a problem. This paper begins by answering the why and when of these questions. Such methods can be beneficial to resolve real-time problems. It then goes into the fundamentals of classification and regression problems at a world-class level. Exemplifying software to communications infrastructure is presented both for the structured and unstructured interviews by identifying roles performed first at the network's perimeter and cloud bits at multiple levels of the internet protocol suite, with a concentration on the application layer. The core contributions of this research study are as follows: (a) this research study explores the machine learning applications in communication system and networks optimization; (b) it offers an analysis of contributions of machine learning-based anomaly detection approaches to mitigate the security threat and maintains the integrity of entire communication network; (c) additionally, this research study provides further directions for research, future trends as well as challenges including the requirement for intelligent methods for network optimization, signal processing, etc.

Keywords: communication networks; communication systems; machine learning; supervised learning; unsupervised learning

1. Introduction

During the Artificial Intelligence (AI) winter of the late 1980s and early 1990s, awareness that the use of data-driven AI-based technologies in a variety of engineering fields, like as voice recognition analysis and communication systems has increas on AI, which were concentrated on logic-based intelligent systems, the ı odologies is fueled by the success of design recognition apparatuses base ologies consist of a variety of recent computational innovations, such as ı evolutionary optimization schedules,

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Recognition and Evaluation of Heart Arrhythmias via a General Sparse Neural Network

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Abstract: In clinical use, an electrocardiogram (ECG) is an essential medical tool for assessing heart arrhythmias. Thousands of human beings worldwide are affected by different cardiac problems nowadays. As a consequence, studying the features of the ECG pattern is critical for detecting a wide range of cardiac diseases. The ECG is a test which assesses the intensity of the electrical impulses in the circulatory system. In the present investigation, detection and examination of arrhythmias in the heart on the system using GSNNs (General sparsed neural network classifier) can be carried out[1]. In this paper, the methodologies of support vector regression(SVR), neural mode decomposition(NMD), Artificial Neural Network (ANN), Support Vector Machine(SVM) and are examined. To assess the suggested structure, three distinct ECG waveform situations are chosen from the MIT-BIH arrhythmia collection. The main objective of this assignment is to create a simple, accurate, and simply adaptable approach for classifying the three distinct heart diseases chosen. The wavelet transform Db4 is used in the present paper to obtain several features from an ECG signal. The suggested setup was created using the MATLAB programme. The algorithms suggested are 98% accurate for forecasting cardiac arrhythmias, which is greater than prior techniques.

Keywords : Artificial neural networks, General Sparsed Neural Network, heart rhythm disorders, QRS complex average filter, Electrocardiograph, Db4 Wavelet Transform.

I. INTRODUCTION

Cardiovascular arrhythmias are abnormal heartbeats that may make it difficult for the heart to beat regularly. Electrocardiogram (ECG) signals offer important data for the investigation and categorization of various arrhythmia types. For this job, generalised sparse neural networks (GSNNs) may be helpful. To learn the patterns and characteristics that identify various types of arrhythmias, the GSNN model is trained using a dataset of ECG signals with known arrhythmia classifications. Here is a broad explanation of how cardiac arrhythmia analysis and classification using GSNNs can be carried out. The The electrocardiogram (ECG) is a widely used procedure in cardiologist for examining patients' heart health. ECGs may be easily collected by placing surface electrodes on the patient's limbs or chest. In its simplest form, an ECG is an electromagnetic depiction of the muscular contractions of the heart. One of the most well-known and often utilised biological signals in the world of medicine is the ECG[3]. By measuring the peak values of R of the ECG signal throughout a single minute of monitoring (It is straightforward to calculate the heart's rhythm in beats per minute (bpm; see Fig[illegible] ECG waveform). Understanding the ECG signa[illegible] diagnosing cardiac illness and for understandi[illegible] works in various situations. According to the [illegible] Association, 70 million individuals worldw[illegible] cardiovascular disease. An electrode placed on [illegible] in the electrocardiogram (ECG), a testing technique, to gauge the electrical activity of the heart. The shape and pace of a human heartbeat reveal the condition of the heart. It is a less intrusive device that is used to assess cardiac issues and determines a waveform mostly on the skin's surface of a person [4]. Any alterations to the architectural pattern or any anomalies in heart rate or rhythm, which are indications of cardiac arrhythmia, can be seen in an ECG waveform analysis. The length and amplitude of the P-QRS-T wave provide crucial information on the type of cardiac disease. The existence of Na+ and K+ ions in the blood causes the electrical wave. One of the most important elements of the body is the heart. Through the blood, it gives the patient's body oxygen. The heart functions like a muscle pump. A complex network of arteries, veins, and capillaries links the heart to the rest of the body[5]. The electrocardiogram (ECG) consists of a variety of biopotential signals from human heartbeats. The electrodes are placed on the patient's epidermis to record these biopotential signals. It visibly displays the electrical activity of the heart's muscles. ECG facilitates the transmission of information about [illegible] ılatory system. It is a vital and fundamental g with heart problems. It is a valuable and guring out how serious a heart condition is. vity of the cardiac muscles is represented by n, which is made up of distinctive electrical olarization patterns[2]. The ECG signal

Video Streaming over Multimedia Network using TCP

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Abstract- ***This paper aims to study about Video Streaming Services. Video streaming services have become increasingly popular, especially in the wake of the COVID-19 pandemic. These services have reached every corner of the world and have transformed the way we consume media.The business model of a video live streaming platform involves both a streamer and a platform provider, who simultaneously have an incentive alignment and a payoff conflict. The streaming platform relies on the efforts of streamers to strengthen its market share. Streamers can employ influencer marketing to construct their own additional revenue from commercials, which can affect the sales from the advertisements operated by the platform.In addition to advertising, major revenue sources of video live streaming services include subscriptions. To promote marketers' merchandise, video live streaming platform providers can utilize pre-roll ads or mid-roll ads, which appear before a live video starts or in the middle of a live video.***

Indexed Terms- ***Streaming, On-Demand, Live Streaming. Buffering, Bandwidth, Data Packets, Content Management System (CMS), Library, Recommendations, Feedback, Parental Control.***

I. INTRODUCTION

Video streaming services are online platforms that provide multimedia content such as TV shows, movies, music, or audiobooks1. Here's a brief introduction:

What is Streaming?

Streaming is the continuous transmiss video files from a server to a client. In streaming is what happens when consu or listen to podcasts on Internet-con

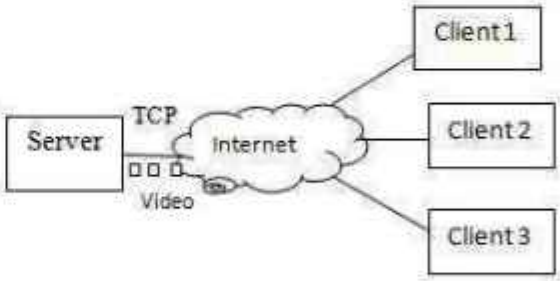
With streaming, the media file being played on the client device is stored remotely, and is transmitted a few seconds at a time over the Internet.

How Does Streaming Work?

Just like other data that's sent over the Internet, audio and video data is broken down into data packets. Each packet contains a small piece of the file, and an audio or video player in the browser on the client device takes the flow of data packets and interprets them as video or audio.

Streaming vs Downloading:

Streaming is real-time, and it's more efficient than downloading media files. If a video file is downloaded, a copy of the entire file is saved onto a device's hard drive, and the video cannot play until the entire file finishes downloading. If it's streamed instead, the browser plays the video without actually copying and saving it



II. FEATURES OF STREAMING SERVICES

Streaming services offer a variety of features to enhance the user experience. Here are some key users often look for in streaming

interface: A simple and intuitive rucial. Statistics show that 70% of

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Unveiling Market Dynamics through Machine Learning: Strategic Insights and Analysis

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Abstract: Due to their extensive knowledge and potential to change the game, artificial intelligence (ML) and strategic analysis have become significant players in more competitive and global markets. The article "Unveiling Market Dynamics through Machine Learning: Strategic Insights and Analysis" provides the first in-depth analysis of the strong connection between machine learning and market analysis, illustrating how these two fields can collaborate to understand the complex market dynamics. Thanks to this research, businesses may now analyse complex patterns, hidden trends, and untapped opportunities in complicated market economies. He accomplishes this with the help of AI's capabilities. Another essential element of this relationship is emotion analysis, which makes use of the deep learning and natural language processing to examine public sentiment and provide vital information for improving marketing and product development strategies. The ability of ML to recognise fresh opportunities and niche markets gives it a competitive advantage. Furthermore, it excels at proactively identifying anomalies, cracks, and risks. This study highlights the integration of various data sources and the growing significance of ethical considerations in addition to providing a broad overview of ML's applications in market analysis. This research expands our understanding of the potential for data-driven decision-making as we navigate the intersection of ML and strategic market analysis. It also provides a road map for organisations looking to harness ML's transformative power to make knowledgeable, quick, and strategic decisions in today's dynamic business environment.

Keywords: *Machine Learning, Market Dynamics, Strategic Insights, Data-driven Decision-making, Predictive Modeling*

1. Introduction

Businesses are going through a significant change in how they operate and strategy in the age of digital transformation. Organisations can now acquire unheard-of insights into market dynamics because to the increasing proliferation of data and developments in machine learning (ML). In order to provide readers with a thorough grasp of how ML approaches can be used to reveal hidden patterns, trends, and opportunities in complicated markets, this paper examines the relationship between machine learning [1] (ML) and strategic analysis. Traditional market study methods frequently fall short of capturing the nuances of today's complex business environment. The amount, speed, and variety of data produced every day make static models and manual data processing inefficient. On the other side, machine learning thrives in this environment of abundant data. Massive datasets and computer capacity enable ML algorithms to sift through enormous volumes of data to find patterns and connections that escape human examination.

Fundamentally, ML enables businesses to forecast future market moves with a level of precision and detail that was previously unachievable. Businesses may predict market trends, consumer behaviour, and even economic indicators by using historical data and techniques like regression, decision trees, and neural networks. Strategic planning is transformed by this predictive power, which enables businesses to effectively allocate resources, respond quickly to shifting market situations, and ecision-making procedures [2][3]. ntiment research, a crucial aspect of is another area where ML thrives. ML assess public attitude towards certain nd sectors of the economy by analysing

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Carbon chain: Transparency in Carbon Credit by Automating Data-Management Using Block chain

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Abstract

A systematic literature review is presented to analyze the art in block chain-based solutions applied to the carbon credit and trading context. This review article is based on literature survey and information gathered from different resources. Carbon emissions have become global challenge, it requires innovative solutions. Carbon credit and trading based on block chain is one of the best solutions. We propose a review on block chain-based platform that makes carbon tokenization secure, transparent from their creation to retirement. Smart contracts are used to automate the verification and trading processes, ensures trust among stakeholders. This paper highlights the capability of block chain technology to evolve carbon credit management by enhancing transparency, traceability, and efficiency. In future, the integration of block chain technology into carbon credit markets can play important role in alleviate climate change.

Keywords – Distributed Ledger Technology (DLT), Smart Contract, Cap-And-Trade scheme (CAT), Carbon Credit Tokenization, Certified Emission Reductions (CERs), Decentralization, Transparency, Security.

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Fitness Web Application for Personalized Workout Plans and Nutrition Guidance

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1. Abstract

The Fitness Website Project is a dynamic and interactive online platform designed to cater to fitness enthusiasts, offering a comprehensive range of resources, tools, and community engagement opportunities. This project aims to provide a user-centric digital space where individuals can access fitness guidance, track their progress, and connect with like-minded individuals to foster a healthy lifestyle.

Fitness experience through personalized user profiles, visitors can set fitness goals, track workouts, and monitor their progress over time. The platform also offers a diverse selection of workout routines, catering to various fitness levels and preferences, including strength training, cardio workouts, and flexibility exercises

One of the project's key highlights is its nutrition and diet component.

The website provides users with access to customizable meal plans, nutritional information, and dietary tips. This enables individuals to align their fitness goals with a balanced and tailored approach to their nutritional intake

Technical Keywords: Supportive community, Nutrition and diet, Dynamic and interactive online platform.

2. Introduction

In an era defined by technology and information, the pursuit of a healthier lifestyle and physical well-being has become an ever-present goal for individuals of all ages and backgrounds. The desire to lead a healthier life, stay fit, and manage one's wellness has created a significant demand for accessible and user-friendly fitness platforms. These platforms serve as invaluable resources, empowering users to track their progress, set and achieve fitness goals, and foster a sense of community and support.

The integration of modern w ovided a gateway for the creation of innovative and feature-ric e and engaging user experience.

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AI BASED MOCK INTERVIEW EVALUATOR AND ANALYSIS: TO ANALYZE EMOTION,CONFIDENCE, AND KNOWLWDGE

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1. Abstract

Mock interviews are an excellent way to practice for a real job interview. When you conduct a practice interview, you put yourself in a situation that is similar to an actual job interview. It allows job seekers to practice, receive feedback, and improve their skills. A mock interview can also help you develop interview strategies, improve your communication skills, answer difficult questions, and alleviate the nerves that many people feel before a real job interview.

Mock interviews offer a safe environment in which to practice and develop important interview skills such as effective communication, problem-solving, and interpersonal skills. Mock interviews help people gain confidence and reduce anxiety, allowing them to be more comfortable and composed during actual interviews.

Mock interviews provide constructive feedback, allowing individuals to identify and work on areas of weakness.Mock interviews expose candidates to different interview formats and styles, ensuring that they are better prepared for various types of interviews, such as behavioral, technical, and panel

Individuals can improve their self-presentation skills, such as body language, attire, and overall demeanor, by participating in mock interviews.

Practicing with a variety of interview questions in mock interviews allows people to develop well-structured and compelling responses.Mock interviews teach candidates how to effectively manage their time during an interview, ensuring they address key points within the time allotted. Mock interviews help people clarify their career goals and objectives, which can result in more focused and successful interviews.Those who spend time practicing mock interviews outperform their peers in real interviews, giving ther › market interviews.

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Stock prices predictors with the help of time series using machine learning.

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ABSTRACT

The purpose of project title stock prices predictor with the help of time series has domain machine learning aims to develop model that can forecast future prices using time series analysis and machine learning techniques .This stock market is known for its volatility making it difficult accurately predict future stock prices however by leveraging historical data and applying time series analysis it is possible to identify patterns and friends then may help in predicting the priciest project will begin by collecting historical stock price letter from various sources data data will include information such as openings price loading price high and low prices. deliverance lexus the collector that i will be free process and clean to re outliers and inconsistent. After the battery presentations is the project with focuses on features engineering very loving features will be selected orthodox to potentially include a predator currency of the modern technique indicative searches moving averages really cool springs index and movie average convert again divergence maybe calculator to capture imported market trends and diamonds.

Forecasting the stock market movements is an important and challenging task. As the Web information grows, researchers begin to extract [illegible]'s and sentiments) from the Web to facilitate the prediction. However, [illegible] studies are usually based on only one data source and thus may not [illegible] ct the stock market movements. In

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Survey on Searchable Encryption against Keyword-Guessing Attack in Cloud computing

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Abstract— A type of encryption called searchable encryption (SE) allows cloud tenants to look for encrypted data while maintaining data security. Many search engine solutions still struggle with Insider Keyword-Guessing Attacks. This implies that the potential keywords can be discovered by internal hackers offline and used for search purposes. Additionally, in current SE systems, a cloud server that is somewhat honest but suspicious may provide inaccurate search results by carrying out a small percentage of retrieval activities in an honest manner. This system can accomplish verifiable search ability and survive internal KGA. We first introduce the basic version of VSEF and then demonstrate how the improved version can simultaneously make dynamic changes to data, encrypt multiple keys, and search for numerous keywords. This shows how important it is for SE to be practical and scalable in real-world applications using advanced encryption techniques.

Keywords–Advanced encryption, insider keyword- guessing attack, multi-keyword search, multi-key encryption.

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Ola / Uber price prediction on mobile app or web

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ABSTRACT

In recent years, Ride-on-Demand (RoD) services such as Uber, Ola, and Rapido have emerged as popular alternatives to traditional taxi/cab services.
These services operate 24/7 and cater to tens of thousands of customers.

Unlike traditional cabs, RoD services do not offer a fixed price. Instead, they utilize Dynamic Pricing to balance supply and demand, taking into account factors such as location, time of booking, ride demand, and driver availability to improve their service.
However, the unpredictable and fluctuating nature of dynamic pricing has posed a significant challenge for customers, leading them to pay higher fares without their knowledge.
To address this issue, it is crucial to estimate dynamic prices accurately and provide the lowest possible fares to customers.
We also evaluate the contribution of different features to dynamic pricing, determining which factors playthe most significant role in determining fare prices.
By analyzing the relationship between demand pricing and relevant features extracted from the datasets, weare able to carry out price prediction.

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DeepVision: Deepfakes Detection Using Human Eye Blinking Pattern

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ABSTRACT

The ability to detect human emotions and cognitive states through non-invasive means has garnered significant interest in recent years. Human eye blinking patterns, a subtle yet expressive behavior, offer a potential avenue for such detection. This abstract presents a novel approach to utilize eye blinking patterns as a means of abstract detection, focusing on emotion recognition, cognitive workload assessment, and various applications in human-computer interaction andhealthcare.

The human eye blinks involuntarily, but their frequency, duration, and regularity can vary in response to emotional states, mental work- load, and various stimuli. Recent advances in computer vision, machine learning, and wearable technology have enabled the capture and analysis of these patterns with high precision. By examining the dynamics of eye blinking patterns, we can gain insights into the individual's mental and emotional states.

KEYWORDS

Eye Blinking Pattern

Eye Blinking

Security

Deep Fake

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Block chain Based E-Voting System

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ABSTRACT

Block chain technology has emerged as a disruptive force with the potential to reshape the landscape of electoral systems, offering secure, transparent, and efficient e-voting solutions. This research paper provides a comprehensive analysis of the latest advancements and key challenges associated with block chain-based e-voting systems, offering insights into their potential to revolutionize modern democracy. The paper begins by examining the evolution of block chain technology and its application to e-voting, highlighting recent developments and research findings. It explores the core principles of block chain that ensure tamper-resistant record-keeping, transparency, and trust in the electoral process. Challenges and considerations are also addressed, including identity verification, scalability, regulatory frameworks, and privacy concerns. Recent research on these topics is presented, shedding light on innovative solutions and ongoing debates in the field. The research emphasizes the importance of accessibility and inclusivity, discussing the potential of block chain-based e-voting to reduce barriers to participation for diverse populations. The paper also discusses real-world pilot projects and case studies, providing insights into their successes and challenges. The abstract concludes by underlining the significance of decentralized block chain-based e-voting to enhance the integrity and accessibility of electoral systems while acknowledging the ongoing research and development needed to fully realize their potential in shaping the future of democracy.

Keywords: Block chain, E-Voting System, Secure, Tamper-Resistant, decentralized, Democracy, etc.

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Web Application For Innovate and Elevate Ideas

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ABSTRACT

The paper focuses on the usability of Web Application for Innovate and Elevate Ideas from a human-computer interaction (HCI) perspective. The Web Application for Innovate and Elevate Ideas is a platform for young innovators to solve real-world problems by developing innovative solutions. The website plays a crucial role in facilitating the registration, submission, and evaluation processes of the hackathon. The objective of this study is to evaluate the website's design and functionality based on established HCI principles and identify areas for improvement. The research methodology involved a heuristic evaluation of the website by a group of HCI experts, followed by user testing to validate the findings. The results revealed several usability issues that hindered the user experience and suggested improvements that could enhance the website's overall usability. The study concludes that adherence to HCI principles is crucial in designing effective and user-friendly websites, particularly for online events such as competition. The research provides insights and recommendations for website designers and developers to improve the overall user experience of the Innovate and Elevate Ideas website.

Keywords: Human Computer Interaction, Innovate and Elevate Ideas, HCI Principles, Usability, HCI Research.

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Dynamic Health Care System -Web Application

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ABSTRACT -

Web-based healthcare services face significant challenges in the years to come with regard to concepts, strategies, and implementation due to the demanding and delicate nature of the technology involved. Demographic changes including aging populations, labor shortages, and the proliferation of technological instruments are to blame for this. Therefore, Dynamic Health Care is regarded as an essential tactic to solve these problems. The use of information, communication, computer, and sensing technology throughout the full spectrum of tasks and processes that make up the practice and delivery of health care services is referred to as "dynamic health care." Dynamic Healthcare is provided via integrated applications in the healthcare setting, which incorporate a computer, communication, and sensor technology. When it comes to dynamic healthcare data, various definitions and objectives are used. As part of our effort, we created a dynamic healthcare application just for pneumonia, diabetes,and heart disease patients. We constructed a classification model that records a person's symptoms and predicts the likelihood of diseases that the person is suffering from by utilizing machine learning techniques like Random Forest (RF), Decision Tree, Support Vector Machine (SVM), Logistic Regression, K-Nearest Neighbor algorithm (KNN), and Convolutional Neural Network algorithm (CNN).The Django framework for Python is the foundation of this application. The database that will be utilized throughout the web application is MYSQL. Getting a health warning before it's too late is easier and saves time.

The dynamic health care model enables users to communicate with healthcare professionals, access medical records, conduct health information research, and exchange messages with one another.

Keywords-

Python, Machine learning, Efficiency Treatment, Django, K- Nearest Neighbor Algorithm (KNN), Support Vector Machine (SVM), Decision Tree, Logistic Regression, Random Forest (RF) Convolutional Neural Network (CNN) Algorithm, MYSQ

Machine Learning: Smart Health Care System: Leveraging Machine Learning for early detection.

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ABSTRACT

The purpose of this paper is to show concisely how we can promote chatbots in the medical sector and cure infectious diseases. We can create awareness through the users and the users can get proper medical solutions to prevent disease. We created a preliminary training model and a study report to improve human interaction in databases in. Through natural language processing, we describe the human behaviours and characteristics of the chatbot. In this paper, we propose an Chatbot interaction and prediction model using a deep feedforward multilayer perceptron. Our analysis discovered a gap in knowledge about theoretical guidelines and practical recommendations for creating chatbots for lifestyle improvement programs. Residents who live in rural area normally have limited access to Internet, poor living condition and limited access to healthcare services. Besides, medical specialists are not available every day. As such, quality of healthcare services in rural area is extremely low. In Saudi Arabia, there are approximately 5.69 million people living in rural area (resour es a framework to develop mobile health application to aid the resour

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Interpreting Doctors Notes using Handwriting Recognition and Deep Learning Techniques

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Abstract:

This Project introduces a Doctor's Prescription System incorporating handwriting recognition for medicine names through a Convolutional Neural Network (CNN) developed with TensorFlow and OpenCV. Comprising the Handwriting Recognition Pipeline and the Doctor's Prescription System App, the pipeline extracts handwritten words from prescription images, while the Android app offers a user-friendly interface for doctors and patients, seamlessly integrating the recognition model.

Keywords— Doctor's Prescription System, Handwriting Recognition, Convolutional Neural Network (CNN), TensorFlow, OpenCV, Android App, Healthcare Digitization, EMNIST Dataset, Flutter, Firebase, Medication Management, Image Processing.

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Voice Of Innovation: i Voice Chatbot

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***Abstract*— In the sphere of sophisticated conversational agents, the i Voice Chatbot stands as a revolutionary stride, integrating Google AI's Bard API to bestow an unparalleled blend of intellect, accessibility, and efficacy. This pioneering feat not only elevates India's status in the AI-driven chatbot development but also heralds a new epoch in human-computer engagement.**

The crux of innovation within the i Voice Chatbot resides in its seamless fusion with the Bard API, a robust AI tool birthed by Google. This distinctive amalgamation unlocks uncharted territories of chatbot capabilities, endowing the system with the acumen to fathom intricate queries, fashion imaginative textual structures, and furnish holistic responses finely tuned to the user's context and intent.

The i Voice Chatbot surpasses the confines of conventional chatbots through its extraordinary intelligence. The capacity to decipher and grasp an extensive spectrum of natural language inputs, encompassing intricate inquiries, nuanced appeals, and even imaginative cues, sets it leagues ahead of its forerunners. This extraordinary level of intelligence translates into a fluid user experience, empowering individuals to engage with the chatbot in an organic and instinctual manner, assured that their inquiries will be accurately discerned and attended to.

Designing with an emphasis on accessibility and inclusivity, the i Voice Chatbot's vocal interface obviates the necessity for typing, rendering it an optimal solution for those with visual impairments or mobility constraints. Moreover, its aptitude for comprehending an array of accents and dialects ensures accessibility for users from varied linguistic backgrounds.

Keywords: Artificial Intelligent, Chat-Bot , Machine Learning , LLM , NLP , Bard , API , Website User Interface

I. INTRODUCTION

The rapid advancement of artificial intelligence (AI) has permeated various aspects of human life, revolutionizing the way we interact with technology and the world around us. Among the transformative AI-driven innovations, voice-based chatbots have emerged as a powerful tool for enhancing human-computer interaction. These chatbots, equipped with natural language processing (NLP) and machine learning capabilities, enable users to engage in natural conversations, seek information, and complete tasks through voice commands.

The i Voice Chatbot distinguishes itself as a groundbreaking innovation in the realm of chatbots, pioneering the seamless integration of Google AI's Bard API. This unique combination unlocks a new level of intelligence, empowering the chatbot to comprehend complex queries, generate creative text formats, and provide comprehensive responses tailored to the user's context and intent.The i Voice Chatbot's remarkable capabilities are underpinned by its integration with the Bard API, a sophisticated AI tool developed by Google. This powerful API provides the chatbot with access to a vast storehouse of knowledge and the ability to process and understand complex natural language inputs. By leveraging the Bard API's capabilities, the i Voice Chatbot transcends the limitations of conventional chatbots, establishing itself as a truly intelligent and versatile conversational AI system.

In the ever-evolving landscape of technology, the realm of artificial intelligence (AI) has emerged as a transformative force, revolutionizing the way we interact with th breaking innovations driven by AI, vosice-

An Automatic Car Accident Detection Method Based on Cooperative Vehicle Infrastructure Systems

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Abstract— With population growth, the demand for vehicles has increased tremendously, which has created an alarming situation in terms of traffic hazards and road accidents. The road accidents percentage is growing exponentially and so are the fatalities caused due to accidents. However, the primary cause of the increased rate of fatalities is due to the delay in emergency services. Many lives could be saved with efficient rescue services. The delay happens due to traffic congestion or unstable communication to the medical units. The implementation of automatic road accident detection systems to provide timely aid is crucial. Many solutions have been proposed in the literature for automatic accident detection. The techniques include crash prediction using smartphones, vehicular ad-hoc networks, GPS/GSM based systems, and various machine learning techniques. With such high rates of deaths associated with road accidents, road safety is the most critical sector that demands significant exploration. In this paper, we present a critical analysis of various existing methodologies used for predicting and preventing road accidents, highlighting their strengths, limitations, and challenges that need to be addressed to ensure road safety and save valuable lives.

Keywords_Car accident detection, C ing.

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Online Voting System

[A Literature Survey]

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I. Abstract

An online voting system is a platform that aims to make the election process more efficient and up, to date. It allows voters to conveniently cast their votes from using user friendly interfaces. This summary highlights features and considerations for a voting system emphasizing the incorporation of strong security measures, accessibility for different types of users and the use of advanced technologies to ensure that voting is both reliable and confidential. The system includes processes such as user authentication, encryption and multiple layers of verification to prevent fraud and unauthorized access. Additionally the summary explores how an online voting system can potentially increase voter participation by offering convenience and flexibility while addressing concerns regarding cybersecurity, privacy and overall trustworthiness, in voting platforms.

II. Introduction

Welcome to our state-of-the-art online voting system, a robust and secure platform designed to transform democratic processes Our work is proven using advanced Java frameworks and SQL databases well mixed, providing a seamless and reliable voting experience. Powered by Java, our system boasts a scalable and vers mance across environments. Using Java's object-oriented prin nterface that assures an intuitive and intuitive voting process for u k and real-time updates enhance

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Anemia Estimation Using a Machine Learning Model

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Abstract:

Anemia is a serious global public health problem that it mainly affects young children, menstruating teenage girls and women and pregnant and postpartum women. WHO estimates that 40% of children aged 6-59 months, 37% of pregnant women and 30% of women aged 15-49 worldwide suffer from anemia. That's how it will before the health of the patient, it is better to estimate it at an early stage and get it cured. We recommend a machine learning model for blood estimation based on circulatory criteria.

Patients with COVID-19 usually have a lower respiratory track disease, although it usually affects other organ systems rule. Hematological manifestations such as thrombocytopenia and a reduced number of lymphocytes and eosinophils is highly prevalent COVID-19 and have prognostic significance. A lot in the final generating as well as retrieving data rapid increase in creativity, so how to understand a large amount usually uncontrolled records that are the subject of information exploration, which is the processing process of finding trends in huge data collection including approach at the intersection of the machine learning, studies and facilities data sources the main cause of natural the development of InfoTech, Information exploration is used in numerous treatments such as health center, services, learning, scams discovery and bioinformatics. In the case of bioinformatics, it helps doctors remove valuable know-how coming from extensive data sets collected in the field of biology as well as individuals get a much better and much cheaper hospital. In hematology laboratory, which is a useful tool in care laboratory information of health status diagnostics, hematological data is a daunting and interesting obligation in a medical investigation region, therefore our company recommends a model that will help produce Comparison of different discriminant and regression approaches using Scikit-Learn.

In the past many decades, each of the generating and also collecting data quickly increases creativity, so how about it understand a large amount of usually unchecked records, i.e., the goal of information research, which is the processing process finding trends in large collections of data, including approaches to root device connection for machine learning, studies and data of the natural development of InfoTech, informa used in many treatments such as health center, fraud detection and bioinformatics. When bio doctors remove valuable know-how coming from collected in the field of biology as individuals ge much more budget friendly hospital. It is a useful hematology laborator information of health diagno

Hematology data is a daunting and interesting duty area of medical investigation, so we recommend a model to help you create comparison of different discriminant and regression approaches using Scikit-Learn.

We are very pleased to present the preliminary project report on "Estimation of anemia in patients with COVID-19 using a .A Machine Learning Model". I would like to take advantage of this opportunity. I thank my internal guide Prof. S. V. Phulari sir for giving me everything the help and guidance I needed. I am really grateful to them for their kind support, support. Their valuable suggestions were very helpful.

Keywords:
Machine Learning, Hemoglobin, SVM

1. INTRODUCTION

For many decades, each generation and also collection of data is rapidly increasing creativity, so how to make sense of the large amount of usually unchecked records that are the target of information research. Which is the processing process of finding trends in huge collections of data including approaches at the intersection of machine learning, studies and data source facilities is the main reason for the natural development of InfoTech, information exploration is used in many treatments such as health center, services, learning, fraud detection and bioinformatics. In the case of bioinformatics, it helps doctors remove valuable know-how coming from vast datasets gathered in the field of biology and also individuals to get a far better and much cheaper hospital.

In the hematology laboratory, which is a useful tool in the care of laboratory information for the diagnosis of a medical condition, hematology data is a daunting and interesting duty in the field of medical investigation, so we find a model to help us make comparisons of different differences and also regression approaches. Using Scikit-Learn. In the available data set, ta is divided into four periods: Data selection, records, regression algorithm.

tion techniques used commonly create prototypes stimate the future evolution of the data. The basic ision tree induction is the greedy algorithm

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AN EFFICIENT ELECTRICITY THEFT DETECTION BY USING OCR AND SARIMAX ALGORITHM

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ABSTRACT:
Electricity theft has caused huge losses over the globe and the trend of its perpetuation constantly evolve even as smart technologies like smart meters are being deployed.This system is proposed to detect the electricity theft, in which reading of electric meter through images are used and preprocessing done with the help of OCR and SARIMAX algorithm. we are using OCR(Optical Character Recognition) algorithm for image processing to cover smart meter image into digital format and SERIMAX classifier to deal with seasonal dataset to detect electricity losses. In this proposed system, we are detecting electricity losses by taking smart meter reading image as input using OCR(Optical Character Recognition) and SERIMAX algorithms. User's monthly electric meter is captured in the camera and stored into the dataset. Upon successful completion of comparison between the meter unit values and its monthly meter average if we get difference between them then theft is detected. The values which actually goes under computation are trained and the results are displayed over the screen.This model provides an accuracy of 95% compared to previously proposed models which provide much lower accuracy.

Keywords – OCR,Sarimax,Image Processing.

1.INTRODUCTION:

Electricity theft is a global menace whose trend of perpetuation constantly evolves even as smart technologies are being deployed. It occurs sporadically and inflicts huge economic losses and also threatens power systems' sustainability. So many approaches have been reported for energy theft detection using the data from conventional meters mainly by the application of artificial intelligence techniques etc. but these solutions hardly focus on energy theft detection in real time. power theft is so frequent in developing and under developed countries that it is also kept out of the public spotlight[4]. Tampering with metres to low metre reading, stealing electricity via bypassing a meter, bi... ...lls all are symptoms of electricity losses. Billing irregularities include erron... service personnel and purposeful bill manipulation by office personnel in ... customer. To help this growth electricity plays a vital role. The conventional ...tricity like thermal power generation and nuclear power generation and non-c... r, hydro power, solar power, tidal power, etc. Central and state government ha... generating and maintaining the electricity. Still so many cases of electricity th... being recorded hence some actions are needful to overcome this problem. V... proaches for detecting electrical pilfering have been proposed in the past. Non... pecting clients with suspect load profiles, in whose case we develop a supervi... tection model that determines whether an unusual pattern has happer... ng smart meter reading image...

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Security management for transaction and KYC using Blockchain Technology

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Abstract:

The electronic know your customer (e-KYC) system allows a banking or identity provider to set up a customer identification data verification process between reliant parties. Most banks deploy their e-KYC system on the cloud due to the efficient resource consumption and high degree of accessibility and availability.The KYC methods employed by banks are entirely reliant on encryption, which is slow and can result in the leakage of consumer information to third-party financial organizations. This system can be made more efficient by utilizing Blockchain technology, which has the potential to automate many human operations while also being resistant to attacks of any kind. The immutable blockchain block and its distributed ledger are an ideal complement to the KYC procedure. Fraud detection can be automated with the addition of smart contacts .We can use any type of KYC to store KYC identification details. As a result, banks can create a shared private blockchain within the bank's premises that can be used to validate documents. This gives the user control over their sensitive documents, while simultaneously making it easy for banks to access the records required for compliance.

Keywords—e-KYC, authentication, AES, key management, access control, block chain

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IMPLEMENTATION REAL-TIME CHAT APPLICATION

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1. ABSTRACT

The rapid expansion of the Internet has prompted a growing number of individuals to favor online communication tools. Conventional real-time chat software generally takes the form of desktop applications that adhere to client-server (C/S) architecture, necessitating the installation of dedicated client programs. In web-based real-time chat solutions dispense with the need for additional client software, facilitating seamless visual communication directly within a web browser. This particular real-time chat application leverages HTML5 The system is composed of a fundamental information management module, a chat communication module, and a space management module. The findings of tests conducted on this system underscore its exceptional suitability for real-world online environments, as it delivers robust security, efficiency, and straightforward maintenance and scalability.

Keywords:
Internet, real-time chat software, security, client-server architecture, web-based real-time chat solutions

2. INTRODUCTION

Real-time messaging and communication applications, commonly referred to as real-time chat apps, serve as essential tools for instant interaction between users. These versatile applications are widely utilized in both personal and professional c popularity due to their convenience and effectiven

Real-time communication apps typically boa interfaces, simplifying the process of signing up, and initiating conversations. They offer a wide ran In the realm of real-time chat applications, a divers research has been conducted to enhance the functi

3. LITERATURE REVIEW

SR. NO	YEAR	TITLE & AUTHORS	METHODOLOGY	ADVANTAGES	DISADVANTAGES
1	2022	Design and Implementation of Web-Based Real-Time Chat Interfacing Server	The paper focuses on developing a web-based real-time chat server to create flexible server-side applications in a network environment	This server offers faster performance when compared to applications built using MySQL and PHP	One challenge with this application is the difficulty in maintenance when there is a significant increase in the user base
2	2019	A Lightweight and Efficient Secure Hybrid RSA Messaging Scheme With Four-Layered Authentication Stack	Four-layered authentication for user privacy. This paper introduces a messaging scheme with a four-layered authentication approach to enhance user privacy	The scheme is designed to provide users with a seamless and speedy experience in their interactions	However, it can be relatively slow due to the handshaking process required to establish connections.
3	2017	Real-Time Chat Application	The paper discusses the development of a real-time chat application using technologies such as React, Firebase, HTML, CSS, and JavaScript.	The application aims to provide users with a user-friendly interface and incorporates advanced features for enhanced user experience	A challenge associated with this application is the complexity of maintenance, especially when the user base experiences significant growth
4	2011	Development of a Real-Time Chat	The paper focuses on the development of a real-time chat application on an intelligent network that utilizes fuzzy logic to determine the priority of each client.	This approach results in a more efficient utilization of server resources and time	However, it may experience reduced performance when dealing with heavy computing traffic

A MACHINE LEARNING APPROACH FOR EARLY DETECTION AND PREVENTION OF OBESITY AND OVERWEIGHT

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ABSTRACT

Obesity and overweight have become a global epidemic that poses significant health and economic challenges. Early detection and prevention are essential to mitigate the negative impact on individuals and society. Conventional methods for identifying at-risk individuals and implementing prevention measures are often insufficient due to their limited scalability and effectiveness. This research proposes a novel machine learning-based approach to address these issues and improve early detection and prevention of obesity and overweight.

The proposed machine learning system starts with data collection and pre-processing, where we collect information about individuals' demographics, medical history, physical activity, and dietary habits. Using a variety of features, we then apply advanced feature detection techniques to extract relevant information. We then employ predictive models, which include decision trees, support vector machines and deep learning neural networks, to develop accurate predictive models. These models aim to identify individuals at risk of obesity and overweight and provide a proactive and personalized approach for early :curacy.

Automated Document Verification System Using Digital Signature And OCR

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ABSTRACT:

The government of India routinely formulates diverse welfare and development initiatives through its ministries. These initiatives ,commonly referred to as schemes, necessitate a broad array of identity documents for program enrollment. During the verification process, these documents undergo meticulous scrutiny by government authorities to ensure their legitimacy. However , this manual verification process is time-consuming and susceptible to inefficiencies. There is a pressing need to address challenges such as counterfeiting and tampering, which pose threats to the authenticity of submitted documents. In order to streamline and enhance this verification procedure, our proposed system leverages digital signature verification and Optical Character Recognition(OCR) technology for automated document authentication. This approach not only expedites the verification process but also addresses concerns related to user authentication, data integrity , and the confidentiality of data generation.

Keywords: OCR, Document Verification, Digital Signature

1.INTRODUCTION:

Various documents serve as crucial identifiers for individuals , confirming their citizenship within a given country. The government of India has instituted numerous citizen-centric schemes, tailored to factors such as financial status ,caste, gender, and more. Access to these schemes hinges on possessing the requisite documentation. In a landscape where manual processes dominate , particularly in India, document authenticity verification is predominantly carried out through automated document verification using image processing. Image processing , a versatile field , is employed to extract pertinent information from images. Specifically, our system utilizes Image Processing Algorithms (IPAs) to identify symbols indicative of document authenticity . By their authentic counterparts , the system distinguishes between genuine and counterf

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Suspicious Activity Detection

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***Abstract*—Suspicious Activity is predicting the body part or joint locations of a person from an image or a video. This project will entail detecting suspicious human Activity from real-time CCTV footage using neural networks. Human suspicious Activity is one of the key problems in computer vision that has been studied for more than 15 years. It is important because of the sheer number of applications which can benefit from Activity detection. For example, human pose estimation is used in applications including video surveillance, animal tracking and behavior understanding, sign language detection, advanced human-computer interaction, and marker less motion capturing. Low cost depth sensors have limitations like limited to indoor use, and their low resolution and noisy depth information make it difficult to estimate human poses from depth images. Hence, we plan to use neural networks to overcome these problems. Suspicious human activity recognition from surveillance video is an active research area of image processing and computer vision. Through the visual surveillance, human activities can be monitored in sensitive and public areas such as bus stations, railway stations, airports, banks, shopping malls, school and colleges, parking lots, roads, etc. to prevent terrorism, theft, accidents and illegal parking, vandalism, fighting, chain snatching, crime and other suspicious activities. It is very difficult to watch public places continuously, therefore an intelligent video surveillance is required that can monitor the human activities in real-time and categorize them as usual and unusual activities; and can generate an alert.**

***Keywords*—Malware, Phishing, Suspicious wire transfers, Identity theft**

I. Introduction

Detecting suspicious activity is crucial across various domains, from cybersecurity to financial transactions and public safety. It involves the use of advanced technologies, algorithms, and vigilant monitoring to identify behaviours or patterns that deviate from the norm and could potentially pose a threat or risk. In cybersecurity, suspicious activity detection revolves around monitoring netwc user behaviours to identify anomalies that cyber threat. This includes unusual unauthorized access attempts, malware acti login patterns.

In the financial sector, suspicious activity detection aims to prevent fraud and money laundering by monitoring transactions for irregularities such as unexpected large transfers, frequent small transactions to evade detection, or transactions involving blacklisted entities. General surveillance for public safety involves identifying behaviours or activities that could signal potential threats, like loitering in sensitive areas, unattended bags, or individuals displaying aggressive or suspicious behaviourr.

Advanced technologies such as artificial intelligence, machine learning, and big data analytics play a pivotal role in enhancing the detection of suspicious activities. These technologies enable the creation of models that learn from vast amounts of data, allowing for the identification of complex patterns and anomalies that might evade traditional rule-based systems. The ultimate goal of suspicious activity detection is to enable proactive measures, such as alerting security teams or triggering automatic responses, to mitigate risks, prevent potential threats, and ensure the safety and security of systems, finances, and public spaces.

II. Literature Survey

Paper Name: ESMD: Enhanced Suspicious Message Detection Framework in Instant Messaging Applications

Author: Mohd. Mahmood Ali, Mohammad S. Qaseem

Abstract : The excessive use of Instant Messaging Applications (IMA) and Social Networking Sites (SNS) has tremendously increased the suspicious information sharing activity which in turn is effectively used for evil purposes too. Many of terrorist and extremist organizations use these as a means of latent untraced communication for criminal activities. Surveillance of instant messages which usually include abbreviated or short- form words with malicious intent are difficult to detect. These words cannot be detected by an earlier OSMD surveillance tool, resulting in the concealment of suspicious messages. For detecting ıges, the SFC program is proposed for renamed as Enhanced Suspicious Message)) Framework that converts short form into and then categorizes the type of crime. y-based information extraction technique ical predefined rules are used for the

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Analyze and Forecast the Cyber Attack Detection Process using Machine Learning Techniques

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ABSTRACT:

In the increasingly digitalized world, cybersecurity has become a paramount concern. With the rising sophistication of cyber threats, traditional rule-based intrusion detection systems have proven inadequate in identifying and mitigating modern cyber-attacks. Machine learning techniques have emerged as a promising solution to enhance cyber-attack detection and response. This abstract provides an overview of the process, challenges, and the potential for forecasting in the domain of cyber-attack detection using machine learning. The cyber-attack detection process involves data collection, preprocessing, feature engineering, model training, and real-time monitoring. Machine learning algorithms, particularly supervised and unsupervised learning methods, are employed to classify and detect anomalous patterns within network and system data. Anomalies may signify potential cyber-attacks, including but not limited to malware infections, unauthorized access, and data breaches.

Keywords: Cyber Attack Detection, Machine Learning, Data Preprocessing, Feature Engineering

1.INTRODUCTION:

In today's interconnected and digitized world, cybersecurity is an ever-growing concern. With cyber threats becoming more sophisticated and prevalent, organizations and individuals alike are facing an ongoing battle to protect their digital assets and sensitive information. Cyber-attack detection is a pivotal component of cybersecurity strategies, as it serves to identify and mitigate malicious activities before they cause substantial harm. While traditional rule-based intru :n the norm, they often struggle to keep pace with the continuously evolving na ıere the integration of machine learning techniques crucial

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Sentiment Analysis of Customer Reviews using Pre-trained Language Models

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Submitted: 26/03/2023 **Revised**: 27/05/2023 **Accepted**: 12/06/2023

Abstract: Due to the increasing number of reviews, it has become more important for businesses to analyze their customer's sentiments. This paper presents a framework that uses pre-trained language models such as BERT, XLNet, and Electra to analyze these sentiments. The framework is based on the Sentiment140 dataset which contains over 1.6 million tweets with tags. This collection of sentiments allows us to perform an evaluation of the models' performance. The goal of this paper is to analyze the effectiveness of these models in categorizing and understanding the sentiments in customer reviews. BERT, for instance, has demonstrated exceptional performance in various tasks related to natural language processing. Another model that is transformer-based is XLNet, which adds more capabilities by utilizing permutation-based learning. On the other hand, the new generation of model, known as Electra, focuses on the generator discriminator learning. Through the incorporation of these models, we can leverage the contextual understanding of the sentiments in the customer reviews. In this paper, we thoroughly examine the performance of the different models in the framework for sentiment analysis. We tested their precision, recall, F1-score, and accuracy in identifying and categorizing the sentiments in customer reviews. We also discuss the impact of adjusting the models on the task, as well as the tradeoffs between performance gains and computational resources. The findings of the study provided valuable information on the utilization of pre-trained models for analyzing customer reviews. We analyzed the performance of the different models BERT, XLNet, Electra, and BERT, revealing their weaknesses and strengths. This helps businesses identify the best model for their sentiment analysis needs. The study's findings have contributed to the advancement of sentiment analysis and natural language processing. It offers valuable recommendations that will aid in the future research efforts.

Keywords: *Sentiment analysis, customer reviews, pre-trained language models, BERT, XLNet, Electra, Sentiment140 dataset, transformer models, fine-tuning.*

1. Introduction

The field of sentiment analysis is rapidly expanding. It uses NLP to analyze and interpret the data that people share on social media and other platforms. With the increasing number of channels for feedback and comments, organizations can now benefit from this technology. Sentiment analysis is a process that can be used to analyze and interpret the data that people share on social media. It can help organizations improve their decision-making capabilities and develop marketing strategies[1]–[3]. Due to the emergence of deep learning models, such as those used in sentiment analysis, the field of this technology has been greatly expanded. These models have been able to perform various tasks such as detecting token replacements accurately[4], [5].

Due to their ability to analyze and interpret complex data, such as semantic relationships and linguistic patterns, deep learning models have been widely used in the field of sentiment analysis. The Twitter dataset known as Sentiment140 has gained widespread popularity as a standard reference for sentiment analysis queries. Its sizable collection of tweets, which includes a wide range of topics and sentiments, makes it a suitable training material and evaluation aid for models in the field. The goal of this study is to analyze the customer reviews generated by the Sentiment140 dataset using pre-trained models. These models are known to perform well in capturing semantic relationships and contextual information[6]–[10].

The models can learn about the various sentiment patterns in the Twitter dataset by taking advantage of the training they've received from large-scale simulations. The process is carried out in two phases: pre-processing the data and fine-tuning the models[11]. The first step [illegible]ng the data before it is fed into the models. [illegible] methods used to do this include [illegible] text cleaning, and vectorization. In [illegible]portant to consider the imbalanced classes [illegible]n it comes to sentiment analysis. This issue

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Intelligent Conversational Agents Based Custom Question Answering System

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Keywords: Tortoise TTS, Custom Question Answering, VOCA, FLAME, GAN

ABSTRACT

Intelligent conversational agents have become increasingly popular in recent years, and they have numerous applications in education, customer service, and entertainment. In this paper, we present an intelligent conversational agent which will act like a historical personality. The goal of this research is to create a system that can provide accurate and engaging information about historical figures in a conversational manner. The digital characters respond to questions by providing audio responses and changing their facial expressions through lip-syncing. The model utilizes the Azure custom answering service to generate question-answer pairs, which are used to train the model to provide accurate answers to questions. The voice of the digital characters is cloned using the Tortoise TTS model of the TortoiseAI team. The audio responses generated by the voice cloning model are then utilized in conjunction with the VOCA and FLAME models and utilize an end-to-end speech-driven facial animation system based on a temporal GAN. The temporal GAN relies on a generator and three discriminators (frame, sequence, and synchronization discriminators) that drive the generation of an auto-lip-sync talking head using only a still 2D image of a person and a voice clip as input. for lip-syncing and facial expressions of the digital characters. The model's subjective listening test evaluated the lip-syncing and facial expressions, demonstrating that the digital characters produced believable and accurate responses. The proposed system allows users to add new characters and is suitable for educational deployment. User study results demonstrate high accuracy and engaging user experience, suggesting our approach is a promising advancement in educational conversational agents.

DOWNLOADS

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Intelligent Conversational Agents Based Custom Question Answering System

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Submitted: 11/02/2023 **Revised:** 12/04/2023 **Accepted:** 09/05/2023

Abstract: Intelligent conversational agents have become increasingly popular in recent years, and they have numerous applications in education, customer service, and entertainment. In this paper, we present an intelligent conversational agent which will act like a historical personality. The goal of this research is to create a system that can provide accurate and engaging information about historical figures in a conversational manner. The digital characters respond to questions by providing audio responses and changing their facial expressions through lip-syncing. The model utilizes the Azure custom answering service to generate question-answer pairs, which are used to train the model to provide accurate answers to questions. The voice of the digital characters is cloned using the Tortoise TTS model of the TortoiseAI team. The audio responses generated by the voice cloning model are then utilized in conjunction with the VOCA and FLAME models and utilize an end-to-end speech-driven facial animation system based on a temporal GAN. The temporal GAN relies on a generator and three discriminators (frame, sequence, and synchronization discriminators) that drive the generation of an auto-lip-sync talking head using only a still 2D image of a person and a voice clip as input. for lip-syncing and facial expressions of the digital characters. The model's subjective listening test evaluated the lip-syncing and facial expressions, demonstrating that the digital characters produced believable and accurate responses. The proposed system allows users to add new characters and is suitable for educational deployment. User study results demonstrate high accuracy and engaging user experience, suggesting our approach is a promising advancement in educational conversational agents.

Keywords: *Tortoise TTS, Custom Question Answering, VOCA, FLAME, GAN*

1. Introduction

In recent years, advances in artificial intelligence and machine learning have led to the creation of digital characters that can interact with humans in a more natural and engaging way. Digital characters can be used in various applications, such as virtual assistants, customer service chatbots, and video game characters. One important aspect of creating believable digital characters is ensuring that their facial expressions and lip-syncing are accurate and natural. Lip syncing involves synchronizing the movement of a character's mouth with the audio of their speech. In the past, lip-syncing was a time-consuming and difficult task that required a lot of manual work. However, recent advances in deep learning have led to the development of models that can generate accurate lip-syncing automatically [1]. In this research paper, we present a paper that involves the creation of digital characters of historical figures, including Shivaji Maharaj and Albert Einstein, to answer questions visually. The digital characters respond to questions by providing audio responses and changing their facial expressions through lip-syncing. The model utilizes the Azure custom answering service to generate question-answer pairs, which are used to train the model to provide accurate answers to questions. The Azure custom answering service is a cloud-based natural language processing service that allows users to build custom question-answering models. It uses machine learning to extract relevant information from a knowledge base and provide accurate answers to user questions [2]. The voice of the digital characters is cloned using the Tortoise TTS model of the TortoiseAI team. The Tortoise TTS model is a neural text-to-speech model that can generate natural-sounding speech from text[3]. It uses deep learning to synthesize speech that sounds similar to a specific voice. We created a dataset by clipping audio files from movies and YouTube videos to train the Tortoise TTS model to clone the voices of Shivaji Maharaj and Albert Einstein. The audio responses generated by the voice cloning model are further processed using the VOCA and FLAME models for achieving lip-syncing and facial expressions synchronization. These models contribute to creating expressive audiovisual outputs. By ice cloning model with the VOCA and , our system achieves synchronized outputs, providing an immersive and ence for users. The model's subjective

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ELEVATING QR CODE SECURITY THROUGH ENHANCED VISUAL SECRET SHARING

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Abstract
Quick Response (QR) codes have been widely used in applications such as data storage and high-speed machine reading. Anyone can gain access to the information stored in QR codes; therefore, they are unsuitable for encoding secret information without the addition of cryptography or other protection. In this paper, we propose a visual secret sharing scheme to encode a secret QR code into several shares. In contrast with other techniques, the shares in our scheme are valid QR codes that can be decoded with some specific meaning by a standard QR code reader, thereby avoiding raising suspicion in potential attackers. Moreover, the secret message is recovered by XOR-ing the qualified shares, an operation that can easily be performed using smartphones or other QR scanning devices. Experimental results show that the proposed scheme is both feasible and reasonably secure. Our scheme's high sharing efficiency is also highlighted in this paper.

Keywords— QR (Quick Response) Code, healthcare, Health Monitoring, QR Code Technology, Medical Records

I. INTRODUCTION

Quick Response (QR) codes are two-dimensional barcodes that can be used to store a variety of information, such as text, URLs, and contact information. QR codes are widely used in a variety of applications, such as mobile payments, product tracking, and marketing.However, QR codes are also vulnerable to tampering and counterfeiting. To address this issue, researchers have proposed using blockchain technology to improve the security of QR codes.One way to improve the security of QR codes is to use visual secret sharing (VSS). VSS is a cryptographic technique that allows a secret image to be split into two or more shares, such that the secret image can only be reconstructed by combining the shares.Blockchain can be used to improve the security of VSS by providing a tamper-proof way to store the shares. This can help to prevent attackers from tampering with the shares or from forging new shares.The remainder of this paper is organized as follows. Section II introduces some preliminaries concerning our study. The proposed scheme is described in Section III, where contrastive and secure properties are theoretically proved. Experiments and Comparisons are presented in Section IV to illustrate the feasibility of this work and demonstrate how it improves on previous work. Finally, Section V provides conclusions.Modern commercial applications employ QR codes in brand promotion, enriching consumer usage experier ing product information, including promotional videos, web links, etc tegrated with service platforms of governments for the effective deli trative services to the public. The simplicity of QR code generation a phones and IoT has harnessed their extensive adaptation by commercia]. For an example, QR codes allow the consumer to connect to the IoT let scan. Having all objects marked

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MEDICAL DATA APPLIED QR CODE FOR PRIVACY PROTECTION USING AES ALGORITHM, ONE TIME PASSWARD PROTOCOL AND QR CODE GENERATOR ALGORITHM

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ABSTRACT:
Medical data are an ever growing source of information generated from hospitals consisting of patient records in the form of hard copies which can be made easier and convenient by using QR Code of the patient details. Our aim is to build a Health-care Portal system which will provide the features like clinical management, patient records, disease prediction and generate QR Code for every patient as per there updated disease information.
There is a growing concern in the medical field, both on the side of physicians and other care providers as well as on the insurance and payer side about the impact medication non-adherence has on health care outcomes and costs. The widespread uses of smartphones at an unprecedented rate have revolutionized the way people access to information particularly in the health care sector. The use of mobile healthcare applications is a dynamic field and has received great attentions lately. This development provides mobile technology more attractive for mobile health (m-health) applications. The m-health is defined as a wireless telemedicine involving the use of mobile telecommunications and multimedia technologies and their integration with mobile healthcare delivery systems. Including human in authentication protocols, while guaranteeing, is not simple in light of their restricted capacity of calculation and remembrance. We exhibit how careful visualization outline can improve the security as well as the convenience of authentication. We propose health care service for generate QR Code through web/android application.
Keywords: QR (Quick Response) Code, healthcare, mobile health (m-health), Health Monitoring, QR Code Technology, Medical Records, etc.

INTRODUCTION

In medical management, more and more information technologies are applied to improve work efficiency. For example, the hospital information management system is used to carry out a patient's basic information and medical management, the wrist one-dimensional QR code is employed to quickly read or input a patient's identity (ID) and so on. Information technology brings convenience while at the same time there are certain secure drawbacks in several typical scenarios because of immature technology or management vulnerability, such as, the health record transparency leaks user privacy, access to view the medical privacy record is not strictly controlled, infusion confirmation is without technical authentication, patient wrist ID is easy to be forged, payment is not convenient and so on.[5]
The objective of this project is information. to develop a system where a person can enter his/her medical The system mainly focuses on the ability to quickly access information in case of any emergency. The users will be able to see the details of the person who needs any kind of medical attention. The system provides the information of the person, which includes his recent medical records and also personal details.
Most current e-/m-healthcare systems require doctors (or system administrators) to participate in medical information processing, v effectiveness caused by manual operations and privacy violation rs' private data. A medical expert system that can automatically an: ı but reduce doctors' participation can address these two problems, p eneral physical examinations. [8]

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Recognition and Evaluation of Heart Arrhythmias via a General Sparse Neural Network

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Abstract: In clinical use, an electrocardiogram (ECG) is an essential medical tool for assessing heart arrhythmias. Thousands of human beings worldwide are affected by different cardiac problems nowadays. As a consequence, studying the features of the ECG pattern is critical for detecting a wide range of cardiac diseases. The ECG is a test which assesses the intensity of the electrical impulses in the circulatory system. In the present investigation, detection and examination of arrhythmias in the heart on the system using GSNNs (General sparsed neural network classifier) can be carried out[1]. In this paper, the methodologies of support vector regression(SVR), neural mode decomposition(NMD), Artificial Neural Network (ANN), Support Vector Machine(SVM) and are examined. To assess the suggested structure, three distinct ECG waveform situations are chosen from the MIT-BIH arrhythmia collection. The main objective of this assignment is to create a simple, accurate, and simply adaptable approach for classifying the three distinct heart diseases chosen. The wavelet transform Db4 is used in the present paper to obtain several features from an ECG signal. The suggested setup was created using the MATLAB programme. The algorithms suggested are 98% accurate for forecasting cardiac arrhythmias, which is greater than prior techniques.

Keywords : Artificial neural networks, General Sparsed Neural Network, heart rhythm disorders, QRS complex average filter, Electrocardiograph, Db4 Wavelet Transform.

I. INTRODUCTION

Cardiovascular arrhythmias are abnormal heartbeats that may make it difficult for the heart to beat regularly. Electrocardiogram (ECG) signals offer important data for the investigation and categorization of various arrhythmia types. For this job, generalised sparse neural networks (GSNNs) may be helpful. To learn the patterns and characteristics that identify various types of arrhythmias, the GSNN model is trained using a dataset of ECG signals with known arrhythmia classifications. Here is a broad explanation of how cardiac arrhythmia analysis and classification using GSNNs can be carried out. The The electrocardiogram (ECG) is a widely used procedure in cardiologist for examining patients' heart health. ECGs may be easily collected by placing surface electrodes on the patient's limbs or chest. In its simplest form, an ECG is an electromagnetic depiction of the muscular contractions of the heart. One of the most well-known and often utilised biological signals in the world of medicine is the ECG[3]. By measuring the peak values of R of the ECG signal throughout a single minute of monitoring (It is straightforward to calculate the heart's rhythm in beats per minute (bpm; see Fig[illegible] ECG waveform). Understanding the ECG signa[illegible] diagnosing cardiac illness and for understandi[illegible] works in various situations. According to the [illegible] Association, 70 million individuals worldw[illegible] cardiovascular disease. An electrode placed on [illegible] in the electrocardiogram (ECG), a testing technique, to gauge the electrical activity of the heart. The shape and pace of a human heartbeat reveal the condition of the heart. It is a less intrusive device that is used to assess cardiac issues and determines a waveform mostly on the skin's surface of a person [4]. Any alterations to the architectural pattern or any anomalies in heart rate or rhythm, which are indications of cardiac arrhythmia, can be seen in an ECG waveform analysis. The length and amplitude of the P-QRS-T wave provide crucial information on the type of cardiac disease. The existence of Na+ and K+ ions in the blood causes the electrical wave. One of the most important elements of the body is the heart. Through the blood, it gives the patient's body oxygen. The heart functions like a muscle pump. A complex network of arteries, veins, and capillaries links the heart to the rest of the body[5]. The electrocardiogram (ECG) consists of a variety of biopotential signals from human heartbeats. The electrodes are placed on the patient's epidermis to record these biopotential signals. It visibly displays the electrical activity of the heart's muscles. ECG facilitates the transmission of information about [illegible] ılatory system. It is a vital and fundamental g with heart problems. It is a valuable and guring out how serious a heart condition is. vity of the cardiac muscles is represented by n, which is made up of distinctive electrical olarization patterns[2]. The ECG signal

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Door lock system using Password and Arduino

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Abstract—Nowadays we required security from stranger. Hence we can design this type of door lock. In this Venture lets learn howto construct a Watchword based entryway bolt framework by meddle Arduino enter the password using the 4×4 keypad.We moreover interface an LCD show to form enter the password and change the password without encoding Arduino Once more. We are employing a Solenoid bolt which locks and opens the entryways by entering the secret word through the keypad and LCD show is utilized to Send events and messages.With this Extend ready to construct a security framework which works with secret word. In this Project we are building a security framework which works with watchword. But by increment in innovation, modern sort of locks such as electronic locks, savvy locks were concocted and individuals are utilizing them broadly to secure their resources. So, lets utilize the highlights Arduino micro control keyboard to function the Solenoid lock utilizing watchword. You'll coordinated this extend with indeed lockers

Keywords:- Arduino, Relay module, Solenoid lock, 4x4 Matrix Keypad Module

1.INTRODUCTION

Password based Solenoid Using the door lock system Keypad and The Arduino would interact with the Arduino with the 4×4 keypad to enter the combination, creating a combination based door lock system. We also added an LCD screen for easy access and change the password without having to re-code the Arduino. We are employing a Solenoid bolt which locks and opens the entryways by entering the watchword From keyboard and LCD show is utilized Send events and messages.With this Extend we are able construct a security framework which works with watchword. In day nowadays life everything is getting to be straightforward and progressed, already to bolt something we utilized to have a locks, combination locks. due to extend in burglaries and innovation, modern of locks such as electronic locks, sharp locks were planned and people are utilizing them broadly to ensure their resources.

From these couple of a long time Fingerprint as lock, RFID based locks, Keen phone app based locks, Confront acknowledgment locks are trending, Watchword based entryway locks are one of them. So,lets utilize the highlights of Arduino microcontroller and keypad to function the Solenoid lock using secret word. You'll be able coordinated this venture with indeed lockers.

2.COMPOENTS REQUIRED

2.1 Arduino Uno board

This microcontroller depends on the ATmega328P. There are all out of 20 pins (0-19) out of which 6 are simple information sources, 14 are computerized input yield pins(6 pins give PWM voltage) which can like be utilized as broadly useful pins, a ceramic resonator of recurrence 16 MHz, a USB association, a force jack and a reset button. It has a working voltage of 5V. It contains all that expected to help a microcontroller.

2.2 4x4 Matrix Keypad

The 4x4 Network Keypad interfaces is to require the input from the individual. Ready to enter the preset secret word to test the legitimacy of the watchword. On the off chance that the watchword is substantial at that point, the entryway bolt will be opened. In case invalid, the entryway bolt will proceed to be bolted. The 4x4 Matrix Keypad includes 4 rows and 4 columns. There is a transfer that connects every row and column. In our proje keys along with # to change the password.

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Enhanced Detection of Diabetic Retinopathy Using Ensemble Machine Learning: A Comparative Study

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Keywords:
machine learning, ensemble learning, deep learning and retinopathy in diabetics, deep convolutional neural networks (DCNNs), Messidor dataset

ABSTRACT

Diabetic Retinopathy (DR), a microvascular complication, stands as one of the leading causes of vision impairment among diabetic populations globally. This pathology is characterized by the occlusion of retinal vessels, thereby depriving the retinal tissue of essential nutrients. Given the progressive nature of DR and its potential to culminate in irreversible blindness, timely and accurate diagnosis is paramount for effective intervention. Conventionally, the detection of DR relies heavily on the expertise of ophthalmologists, a resource-intensive process that may be prohibitive in terms of cost and time. To address these limitations, automated detection systems have been developed, aiming to hasten diagnostic processes and democratize access to these crucial services. Nevertheless, the performance of such systems has been historically hampered by the scarcity of reliable data sources and medical records for this condition. In response to these challenges, this study explores an ensemble machine learning approach that synergizes multiple established classifiers into a cohesive diagnostic model. The proposed methodology demonstrates superior performance in accuracy compared to prevalent classification algorithms. Utilizing the Messidor dataset, the top-performing five and ten features were isolated into four sub-datasets through InfoGainEval and WrapperSubsetEval methods. The accuracy achieved for the top five features via InfoGainEval was 70.7%, while for the complete feature set, it reached 75.1%. The employment of ensemble machine learning techniques in diagnosing DR represents a significant application of artificial intelligence within the medical domain, conferring advantages such as enhanced accuracy, robustness, efficient feature selection, early detection, scalability, and a reduction in human error, all while ensuring cost-efficiency and enabling continuous monitoring for improved patient outcomes. However, the approach is not without limitations. These include the quantity and quality of data, clinical variability, ethical and privacy concerns, scalability challenges, potential overfitting, intricate feature selection and engineering, bias in data collection, and issues related to cost and accessibility. The findings underscore the efficacy of the sub-datasets, which facilitate a less cumbersome classification process as compared to the full Messidor dataset, thereby streamlining the diagnostic pathway.

1. INTRODUCTION

Diabetic Retinopathy (DR), a major microvascular complication of diabetes mellitus, manifests as damage to the retinal vasculature, resulting in characteristic macular changes such as exudates, aneurysms, and hemorrhages. The earliest recorded observation of macular anomalies in diabetic patients can be attributed to Eduard Jaeger in 1856. However, the definitive correlation between these anomal was not established until 1872 when J. histopathological evidence of retinal destruct cystoid processes in diabetic individual Diabetic Retinopathy was first identified by V 1876, marking a significant advancement in tl of DR [1].

Symptoms of DR, as described by the Mayo Clinic [2], often include vision spots, fluctuating visual acuity, chromatic aberrations, and in severe cases, complete vision loss in one or both eyes. These manifestations are the result of progressive occlusion of the retinal microvessels, which are essential for the nourishment of the retina. Consequently, automated diagnostic methods for detecting diabetic retinal damage are increasingly recognized as critical. While deep learning yielded high accuracy in binary classifications :acy in multi-class categorizations, especially :ease diagnosis, remains suboptimal.

/ for expedited clinical assessments and derscored by factors such as high patient :mergent care scenarios. Furthermore, the rdable treatment is a fundamental healthcare

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INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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NOAA SATELLITE IMAGE RECEPTION USING OFH ANTEENA

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ABSTRACT :-

Satellite imaging is widely used to monitor weather and interpret satellite images. Time limitation in accessing weather satellite image data is still a major problem for satellites. Automatically send images on 137.9125 MHz and 137.1000 MHz. NOAA 18 and NOAA 19 weather frequencies. In this study, data was collected with the help of a quadrangular helical antenna and RTL-SDR. Four-line H satellite imaging to obtain these two frequencies is widely used to monitor weather and interpret satellite images. Limiting immediate access to weather satellite imagery is still a major challenge for the 137.5 MHz design elix antenna. Use WXtoImg software to collect, analyze, edit and display automated transmission images. Although the automatic transmission image of NOAA 18 received a frequency shift of 0.0685% and NOAA 19 had a frequency shift of 0.0686%, the results are clear enough and explainable. Use WXtoImg software to collect, analyze, edit and display automated transmission images. The results show that although there is a difference of 0.0685% and a frequency shift of 0.0686% in the automatic transmission images received by NOAA 18 and NOAA 19, the received weather satellite images are clear and descriptive enough.

INTRODUCTION

Real-time access to local weather satellite image data is still limited and the confidential information it contains is difficult to decipher. Publicly available APT (Automatic Picture Transmission) signals make NOAA weather satellites an alternative method of receiving weather satellite images. NOAA 18 and NOAA 19 satellite weather data are useful in GIS (Geographic Information System) for disaster mitigation, scientific research, economic management, construction planning, cartography, and road planning [1]. NOAA weather satellites carry five types of sensors, one of which is AVHRR (Advanced Very High Resolution Radiometer) [2]. The AVHRR sensor is responsible for detecting electromagnetic waves reflected from clouds and objects on the earth's surface, as well as currents emitted by air and water. The AVHRR sensor consists of 6 detectors that operate on radio waves of different wavelengths, from visible light to thermal infrared.

The APT signal transmitted by NO… …cular polarization), so a good RHCP antenna is required [3] [4] [5] This ar… …re and software to acquire and identify APT signals on the NOAA 18 and N… …best antenna for APT reception at 137 MHz is the QFH antenna (quadruple l… …H antenna using the same size copper pipe. QFH antennas break the idea th… …ires a large dish. QFH antennas made of copper pipes also promise ease of… …nt area for enabling a wide range of software applications that enable con… …ation [9]. Many SDR devices are used as NOAA weather satellite receivers [… …: RTL-SDR. This SDR uses Realtek® RTL2832U as the controller and Rafa…

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PLC-Based Automatic Stamping System

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Abstract: This paper represents the design project of the application of a stamping process. The stamping mechanism is controlled by PLC hence it can be implemented in small scale as well as big industries for faster operation and less labour requirement. Automatic stamping of object has received significant attention because automatic stamping is reliable and reproducible. This system uses Allen Bradley PLC, an integrated PLC with uploaded Ladder Logic Programming using Studio 5000 to control multiple machine operation for product sorting. Multiple machine operation of product includes Conveyor, start push button, stop push button, solenoid actuator, Inductive sensor. This current trend of stamping problems has made the small scale enterprises to lose large number of market share to the large scale manufacturing outfits. The need to make stamping process affordable, using easy to maintain machines and also complying to rood regulatory bodies necessitated the need for this work.

I. INTRODUCTION

Conventional method for object stamping is manual, it is very time consuming and in non-automatic form. Continuous stamping or printing results in hand fatigue requires lots of efforts and also affects the accuracy to result so the manual method must be replaced by PLC Automation. Automatic stamping of object has received significant attention because automatic stamping is reliable and reproducible. This not only reduce manual effort but also gives more time for marketing also prevent danger which might occur when human being works in hazardous environment. Automation greatly improves the profit and productivity, it is very scalable.

By using automatic stamping machine, it is easy to print the logo, name, sticker on blank paper, metal and leather. Hence to attempt this needs fabrication of automatic stamping machine is needed. Although paper is the most common material, it is also frequently done on metals, plastics, cloth and composite materials. On paper it is usually carried out as a large-scale industrial process and is a needful part of stamping. Automation can be defined as the "technology concerned with application of mechanical, electronic and computer-based systems to operate and control production". There are many reasons for automating the process. The reason may be to reduce manufacturing lead time, to increase labour productivity or to improve the worker safety, etc.

II. RESEARCH METHODOLOGY

The main components of Automati[illegible] **PLC I/O** which is the part of the PLC that connects the brain of the PLC, the [illegible] nachines. In a PLC system there will usually be dedicated modules for i[illegible] outputs. An input module detects the status of input signals such as pusl[illegible] isors, etc. to integrate the functioning Product Stamping.

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PLC-Based Tank Temperature Control Using PID Algorithm

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Abstract: This research paper presents a comprehensive study on the implementation of a Programmable Logic Controller (PLC) based system for tank temperature control utilizing a Proportional Integral Derivative (PID) algorithm. The system incorporates a Allen Bradley Micro820 PLC, IO module, a 4-20mA control signal operated Solid-State Relay (SSR), a heater, and a Resistance Temperature Detector (RTD) PT100 for temperature measurement. The objective is to achieve precise and efficient temperature regulation within the tank while minimizing energy consumption.

The paper details the design, development, and testing phases of the system, focusing on the PLC programming for PID control, hardware integration, and calibration processes. Experimental results demonstrate the effectiveness and accuracy of the proposed system in maintaining desired temperature setpoints within the tank, showcasing its potential for industrial applications requiring reliable temperature control mechanisms. Additionally, insights into the system's performance under various operating conditions and potential areas for future enhancements are discussed.

I. INTRODUCTION

In contemporary industrial processes, precise temperature control within tanks is imperative for ensuring product quality, process efficiency, and equipment longevity. Programmable Logic Controllers (PLCs) have emerged as versatile and reliable tools for implementing sophisticated control strategies in such applications. This research paper delves into the development and implementation of a PLC-based system for tank temperature control using the Proportional Integral Derivative (PID) algorithm.

The system under study integrates a Allen Bradley Micro820 PLC, an IO module, a 4-20mA control signal operated Solid-State Relay (SSR), a heater, and a Resistance Temperature Detector (RTD) PT100 for temperature measurement. The utilization of these components forms the basis for constructing a robust and efficient temperature control system capable of maintaining desired temperature setpoints within the tank.

This introduction outlines the significance of precise temperature control in industrial processes, highlights the versatility of PLCs in control applications, and provides an overview of the components utilized in the proposed system. The subsequent sections of the paper will delve into the design, implementation, and performance evaluation of the PLC-ba tem, offering insights into its practical applicability and potential for optimiz

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Pothole Hole Detection And Filling Robot

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Abstract— Potholes can drastically impair driving and road performance. In 2018, 2019, and 2020, there were 2,015, 2,140, and 1,471 fatalities from road accidents caused by potholes, according to data from the Ministry of Road Transport and Highways (MoRTH). Potholes caused 4,775 incidents in 2019 and 3,564 accidents in 2020, respectively. Many researchers and transportation experts have directed their attention toward developing pothole maintenance techniques that work. Our requirement is for a pothole filling equipment that is long-lasting, economical, and requires minimal human labour. The objective of this project is to develop and construct a prototype for the Automatic Pothole Filling Robot, an automated road maintenance vehicle.
Without assistance from an operator, it is capable of automatically locating and fixing potholes on road surfaces. A straightforward mechanical technique was created to find potholes. It assists in reducing the expenses and complexity, which up to now have been the primary disadvantages of autonomous vehicles used for road maintenance. The breadth and depth of the pothole are measured and detected using ultrasonic sensors. The pothole will be automatically filled by the robot.

Introduction

Roads have a significant positive social impact and contribute significantly to economic growth. They are essential to the growth and development of a country. Roads promote social and economic development by opening up new spaces. Road infrastructure is the most significant of all public assets because of these factors. However, a potho
road as a result of continual loading and v
would be extremely detrimental to human l
structural breakdown in the surface of a rc
brought about by water seeping into the
structure and traffic passing over the impact

Therefore, the goal of our project is to creat
benefit society by increasing road safe
difficulty of spotting potholes, and using l
which will save time. We created a semi-aut

can identify potholes in the road, release the necessary quantity of concrete to fill them, and then use a slider to level the released concrete. As a result, the pothole on the road (Fig. 1 Pothole) may be filled entirely, which would reduce the number of accidents caused by the pothole. Pancake pavement, a flexible base, or a hard composite base would all contain the pothole. The patches of pavement next to the pothole may be made of asphalt. The system had to be efficient in order to place the maximum amount of material each day for the least amount of money and manpower. Calculated operating and maintenance costs influence various technical decisions as well as the system's overall design. The cost of different patching processes can be found from a variety of sources.

1. LITRETURE REVIEW

[1] Identifying and Reporting of Potholes and Humps using IoT Smita Saitwadekar1, Dr. Payel saha2)

One of the most vital problems in developing countries is conservation of roads. Well maintained roads contribute a significant portion to the country's economy. Spotting of pavement distress like potholes and humps helps drivers to avoid accidents or vehicle damages, conjointly helps authorities to take care of roads.

[2]POT-HOLE DETECTION AND CLEARANCE ROBOT Ripal Patel*1, Devayya*2, H. Lallawmawma*3, Harsha KG*4, Suraj P*5

The preservation of roads is one of the most important issues in emerging nations. The economy of the nation is
ted by well-maintained roadways. Finding
ms like potholes helps drivers prevent
hicle damage and also aids in road
merous ongoing efforts in the field of
tworks aim to give drivers pertinent
t the roads and traffic patterns. Indian
requently have potholes, some of which may
herefore, it is crucial to spot potholes and
s in both situations to ensure safe driving. In
eate a sensor model based on the Raspberry

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Smart Hand Glows Using Flex Sensor

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Abstract: Smart hand gloves equipped with flex sensors offer a promising solution for monitoring and assisting patients with hand-related conditions or injuries. These gloves incorporate flexible sensors that detect the degree of finger bending and transmit this data to a monitoring system. The flex sensor technology enables real-time tracking of hand movements and gestures, allowing healthcare professionals to assess the range of motion, dexterity, and muscle strength in patients. Additionally, these gloves can be integrated with smart devices or applications to provide personalized rehabilitation exercises, feedback, and reminders for patients to perform hand exercises regularly. By leveraging flex sensor technology, smart hand gloves have the potential to improve the rehabilitation process, enhance patient engagement, and facilitate remote monitoring of hand related conditions, ultimately contributing to better patient outcomes and quality of life.

INTRODUCTION

Injuries or conditions affecting hand mobility can significantly impact an individual's daily activities and quality of life. Rehabilitation and monitoring of hand movements are crucial aspects of treatment for such patients. Smart hand gloves equipped with flex sensors present an innovative solution to address these challenges. These gloves incorporate flexible sensors that can detect and measure the degree of finger bending and hand movements in real-time. This technology enables healthcare professionals to accurately monitor the range of motion, dexterity, and muscle strength of patients' hands during rehabilitation sessions. Additionally, smart hand gloves can be integrated with mobile applications or smart devices to provide personalized exercise programs, feedback, and reminders to patients. This integration facilitates remote monitoring and enhances patient engagement in their rehabilitation process. We explore the design, functionality, and potential applications of smart hand gloves utilizing flex sensor technology in the context of patient rehabilitation and monitoring. We discuss the benefits of these gloves in improving patient outcomes, enhancing rehabilitation effectiveness, and enabling remote monitoring of hand-related conditions. The motivation behind developing smart hand gloves for patients using flex sensors stems from the pressing need to address challenges faced by individuals with hand-related injuries or conditions. the motivation behind smart hand gloves for patients using flex sensors lies in their potential to revolutionize hand rehabilitation by providing accurate monitoring, enhancing patient engagement, enabling remote monitoring and telemedicine, offering customization, and leveraging technological advancements to improve patient outcomes and quality of life.

The development and implementation of smart hand gloves for patients using flex sensors aim to challenges and problems associatec ion methods. Traditional rehabilitation methods often lack precise monitor ress, leading to inaccurate assessments of rehabilitation outcomes and ine addressing these problem statements, smart hand gloves using flex senso is of traditional rehabilitation methods, improve patient outcomes, enhanc rence, enable remote monitoring, and ultimately transform the delivery o

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Smart pyro Machine

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1. ABSTRACT

Nowday's people are searching for something creative and smart techcnologies for the various events and also for the entertainment purpose, so we are creating our project on the pyro machine or the automatic fireblast machine.The Smart Pyro Machine introduces an advanced system for controlled fire generation and management, leveraging cutting-edge technology to enhance both safety and spectacle in applications ranging from emergency training simulations to entertainment industry special effects. This paper discusses the design and implementation of the Smart Pyro Machine, which integrates real-time sensors, automated control systems to create precise and repeatable fire effects while ensuring user safety and regulatory compliance.

The core innovation lies in the machine's ability toanalyze real-time data from environmental and internal sensors to adjust fuel mixtures, ignition timing, and blast intensity. This adaptive approach allows for high degrees of control and repeatability, essential for both training firefighters in realistic scenarios and for creating visually striking effects in films without endangering cast or crew.

2. INTRODUCTION

In recent years, the integration of advanced technologies such as automation ir and entertainment applications has transformed operational efficiencie protocols. Among the innovative emerging in this area, the Smart P stands out as a pivotal development pyrotechnic and fire management This machine is designed to enhanc precision, and spectacle of controlled fire blasts used in a variety of applications, from film special effects to fire-fighter training and safety demonstrations.

The motivation behind the development of the Smart Pyro Fire Blast Machine is twofold: to push the boundaries of what can be safely achieved in controlled fire displays and simulations, and to provide a tool that minimizes risk while maximizing control and repeatability. Traditional methods of handling pyrotechnics and fire blasts rely heavily on manual intervention, which carries inherent risks and variability in performance. The Smart Pyro Fire Blast Machine addresses these issues by employing a sophisticated suite of sensors, and automated systems that together ensure a high degree of accuracy and safety.

By enhancing control and safety, the Smart Pyro Fire Blast Machine not only improves the operational aspects of fire management but also broadens the creative possibilities for industries reliant on precise and spectacular fire effects.

Designing a "smart pyro machine," or a smart pyrotechnic device, would involve creating a system that can intelligently manage and control fireworks or pyrotechnic displays. This could involve elements of automation, remote control, safety enhancements, and integration with software for design and synchronization.

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Solar Energy Based Mobile Charger

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Abstract- we have use other methods to charge the mobile it is so costly. The solar energy is highly efficient and economical to use. Works on the principle that when light falls on the solar cell, electron -hole pairs are created in the n-type emitter and in the p-type base. The generated electrons (from the base) and holes (from the emitter) then diffuse to the junction and are swept away by the electric field, thus producing. Certain modules are selected and worked out to suitable specifications. Solar energy is generated by nuclear fusion reactions within the Sun. The energy that radiates from the Sun is a mixture of ultraviolet, visible, and infrared radiation. The intensity of this radiation when it reaches the Earth is 1361 W/m2. Our project intension is to create a solar mobile charger. The project design solar energy and stores it in a rechargeable battery form. This system has ability to serve dual role, both as a protective case and act as power backup for the mobile phone in solar energy.

1.INTRODUCTION

A solar power system is an energy store device that obtains energy from the sun and uses it to charge/power various electronic gadgets, like phones, tablets, laptops, and torches, bulbs, and televisions etc.Solar cell phone chargers use solar panels to charge cell phone batteries. It has in-built solar panel which converts the solar energy to electrical energy. It is estimated that the world oil reserves will last for 30 to 40 years, whereas solar energy is forever. Solar energy has two big advantages over fossil fuels. The first is in the fact that it is renewable; it is never going to run out. The second is its effect on the environment. Flaming of fossil fuels is harmful pollutants into the atmosphere and contributes to global warming and acid rain. Solar cell directly converts solar energy into electricity. The solar cells that are connected together make up the solar panel. This can last up-to several decades without replacement.

2.PROBLEM STATEMENTS

Intermittency. One of the biggest problems that solar energy technology poses is that energy is only generated while the sun is shines. That means nighttime and overcast days can interrupt the supply.. During disasters and power outages, it can be used with ease and with a long and forever durability of device and power. Even in the remote areas having scarcity of electricity, such models can be used. In rainy and foggy weather, there may be some rust and some maintenance may be required. We initiated this project because it is one of the few charging systems that uses renewable energy sources, which allows us to avoid power and charge weariness. It is both user-friendly and environmentally friendly. It has long-lasting equipment and high power endurance, making it especially helpful in distant places with limited energy. It may corrode on rainy or foggy days, necessitating extra attention.

2. LITERATURE SURVEY

As proposed by Shushi Sharma, Kamesh Kumar and Ash tosh Kumar in their report on Solar Cells .In this research, we explored the applications of solar cells and how they can be implemented. Battery management and capacity of solar cell and the price range is being covered in this paper. Current solar cell relevance and pertinence is analyzed as proposed by Ansari Mohammad, Bather, Marzari Mohamed, Abdi Valid, and Mirhabibi Mohsen in their report on types of solar cells and applications. The project laid emphasis upon types of cells that can be implemented for the project. The paper talks about the vast uses of solar cells and the categories in which they are available in market. Decision making on the basis of these categories and choosing the best solar cell /panel was covered. As proposed by N.Gupta, G.F ALAPATT, R. PODHILA, R.Singh, K.F Poole in their report on prospects of Nanostructures-based on solar cells for manufacturing photovoltaic modules. We inferred the scope of the project as well as the future implementation of it. The Paper describes new ways in which integration of Nano structures can make regular Solar cells impactful. The potential changes and novelty was understood. Published in IEEE Explore papers. Solar powered mobile phone: An innovative experiment. INSPEC Accession Number: 16980832.

3.1 BATTERY:

A parallel connection of two 2200 mAh : ie batteries in series increases the voltage but not the amperage capacity. All batte pere-hour rating. Connecting the cells in parallel increases the total current capaci verall amp-hour capacity

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Translating Handwritten Document into Digital Text Using Deep Learning Approach

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***Abstract*— Applications like document digitization, text analysis, and data entry all heavily rely on handwriting recognition. Using the Convolutional Recurrent Neural Network (CRNN) architecture andConnectionist Temporal Classification (CTC), the goal of this project is to create a handwriting extractor. The CRNN model combines the strength of recurrent layers for sequential information encoding and convolutional layers for visual feature extraction. Without the requirement for explicit character-level labelling, the CTC layer enables the model to accommodate variable-length input andoutput sequences. The technique under consideration seeks to precisely extract handwritten text regions from photos and offer a solid basis for subsequent text recognition tasks. Preparing the datasets, using pre-processing methods, training the models, and putting the CRNN-CTC architectureinto practise are all included in the project. The performance of the system is evaluated based on metrics such as precision, recall, and F1 score. The results demonstrate the effectiveness of the CRNN-CTC approach in accurately extracting handwritten text and its potential for applications in documentanalysis and data processing tasks.**

Keywords: CRNN, CTC.

I. INTRODUCTION

A cutting-edge platform called Handwriting Extractor is revolutionising the way handwritten documents are handled and converted to digital format. This cutting-edge technology uses machine learningand artificial intelligence to precisely extract text from handwritten documents. We save you time and effort by automating the procedure, which eliminates the need for manual transcription. Convolutional Recurrent Neural Network (CRNN) and Connectionist Temporal Classification (CTC), two of our highly developed algorithms, are trained on enormous datasets to assure remarkable accuracy and efficiency in reading and transcribing handwriting. No matter the handwriting you're working with handwri forms, or historical documents, This Ext manage it. We can maximise the value of ha the digital age with Handwriting Extrac organise, and retrieve information by conv text into editable and searchable formats. Fo to take advantage of the value of handwrit individuals, corporations, researchers, an platform is perfect. Handwriting Extractor and dependability.

II. RELATED WORK

There are many applications such as vehicle license-plate recognition, postal letter-sorting services, Cheque truncation system(CTS) scanning and historical document preservation in archaeology departments, old documents automation in libraries and banks, etc. The topic of deep learning is constantly developing; some of its subfields include autoencoders, CNNs, recurrent neural networks(RNNs), recursive neural networks, deep belief networks, and deep Boltzmann machines. Here, we introduce a convolutional recurrent neural network, a type of deep neural network that finds extensive use in face and object recognition, signal processing, recommendation systems, object recognition, image classification, signal processing, natural language processing, computer vision, and computer-aided design.

There are many applications such as vehicle license-plate recognition, postal letter-sorting services, Cheque truncation system(CTS) scanning and historical document preservation in archaeology departments, old documents automation in libraries and banks, etc. The topic of deep learning is constantly developing; some of its subfields include autoencoders, CNNs, recurrent neural networks(RNNs), recursive neural networks, deep belief networks, and deep Boltzmann machines. Here, we introduce a convolutional recurrent neural network, a type of deep neural network that finds extensive use in face and object recognition, signal processing, recommendation systems, object recognition, image classification, signal processing, natural language processing, computer vision, and computer-aided design.

In addition to sensor-based monitoring, some studies have investigated the use of building design and ventilation systemsto improve indoor air quality. For example, a study by ShunichiHattori (2022) [6] investigated the impact of ventilation sys- tems on indoor air quality in residential buildings. The study found that well-designed ventilation systems can significantly reduce the concentration of indoor pollutants.

r air pollution is a critical issue that has been rched, with many studies investigating the sources, ıtion strategies of indoor air pollution. Further research /elop effective strategies for mitigating indoor air better understand the health impacts of indoor air

Translating Handwritten Document into Digital Text Using Deep Learning Approach

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***Abstract*— Handwriting recognition underpins applications like document digitization, text analysis, and data entry. This project leverages Convolutional Recurrent Neural Networks (CRNNs) and Connectionist Temporal Classification (CTC) to create a handwriting extractor. CRNNs combine the strengths of recurrent layers for sequential information encoding and convolutional layers for visual feature extraction. The CTC layer enables the model to handle sequences of varying lengths without requiring explicit character-level labelling. Our approach aims to precisely extract handwritten text regions from images, laying the groundwork for subsequent text recognition tasks. The project encompasses dataset preparation, pre-processing methods, model training, and CRNN-CTC architecture implementation. We evaluate the system's performance using metrics like precision, recall, and F1 score. The results demonstrate the effectiveness of CRNN-CTC in accurate handwriting text extraction, highlighting its potential for document analysis and data processing tasks.**

Keywords: CRNN, CTC.

I. INTRODUCTION

The ability to automatically extract and understand handwritten text from documents holds immense potential for various tasks, including document digitization, historical document preservation, and data entry automation. Traditionally, these processes relied heavily on manual transcription, which is time-consuming, prone to errors, and lacks scalability. Deep learning has emerged as a powerful tool for automating various aspects of document processing, and Convolutional Recurrent Neural Networks (CRNNs) have proven particularly effective in handwriting extraction.

CRNNs combine the strengths of two powerful deep learning architectures: Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs). CNNs excel at extracting visual features from images, making them [illegible] the spatial characteristics of handwritten cha[illegible] the other hand, are adept at processing seque[illegible] them to model the temporal relationships [illegible] within a word or sentence. By combining CRNNs can effectively analyze handwritte[illegible] extract the embedded textual information.

This project leverages a CRNN-based appr[illegible] robust and accurate handwriting extractor. Th[illegible] to automate the process of extracting handw[illegible] from images, paving the way for subsequ[illegible] recognition and analysis. The proposed system utilizes a CRNN architecture coupled with Connectionist Temporal Classification (CTC) to achieve this goal. CTC offers a robust solution for handling sequences of varying lengths, a common challenge in handwriting recognition.

II. RELATED WORK

The field of document image analysis has witnessed significant advancements with the rise of deep learning techniques. Convolutional Neural Networks (CNNs) have played a pivotal role in various tasks, including character recognition, text line detection, and document layout analysis. Early research explored techniques like LeNet and AlexNet architectures for character recognition, demonstrating promising results([5], [6]). However, these approaches often faced limitations in handling complex handwriting styles and variations.

Recurrent Neural Networks (RNNs) emerged as a complementary approach to CNNs, particularly for tasks involving sequential data like handwriting recognition. Architectures like Long Short-Term Memory (LSTM) networks demonstrated improved capabilities in learning long-range dependencies within handwritten text sequences ([8]). However, RNNs alone struggled with the challenge of variable-length sequences, a common issue in handwriting where words and sentences can have different lengths.

The combination of CNNs and RNNs in CRNN architectures addressed these limitations by leveraging the strengths of both. Pioneering work by Graves et al. [1] established the foundation for CRNNs in handwriting recognition. This approach utilized CNNs for feature extraction followed by RNNs for sequence modeling, culminating in significant performance improvements. Subsequent research explored various CRNN architectures and training strategies, further enhancing the accuracy and robustness of handwriting recognition systems ([2], [3]).

This project builds upon these advancements by implementing a CRNN-CTC architecture specifically tailored for handwriting text extraction. The system is designed to handle the complexities of handwritten documents, paving the way for efficient and scalable automation in document processing tasks.

I. LITERATURE SURVEY

[illegible]xplored various techniques for handwriting extraction [illegible]aditional methods often relied on handcrafted features [illegible]ch lacked robustness and struggled with diverse writing [illegible] of deep learning offered new approaches, with [illegible]ral Networks (CNNs) and Recurrent Neural Networks [illegible]ction.

[illegible]onvolutional Recurrent Neural Network (CRNN) model [illegible]lar interest due to its ability to extract both spatial and

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Onion Classification using Color and Convolutional Neural Network

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Submitted: 14/09/2023 **Revised**: 28/10/2023 **Accepted**: 12/11/2023

Abstract: One of the most critical processes in producing fruits and vegetables is sorting, which is typically done manually in most countries. Onion production is large-scale in India, mainly in Maharashtra's West Region. As a result, it would be more useful in the industry for sorting and grading onions. Food quality detection and grading have benefited from the machine learning application then computer vision techniques. The task of distinguishing infected/uninfected onions from images of their exterior surface is investigated using various methods. One of the supreme important economic sectors in our nation is agriculture and it shows a critical part in our country's economic growth. Agriculture fruits are processed by cutting them from their natural forms, washing, sorting, grading, packaging, and shipping. Grading of onion is a significant step for protecting the quality of fresh-market items. The exterior appearance of the fruits is used to sort agricultural goods. Shape, size, and color are used to grade the items. In this study, HSV ranges are used to categorize onions into red and white colors. A convolutional neural network is also used to categorize the onion pictures into good and damaged quality.

Keywords: *CNN, Color, deep learning, HSV, Onion sorting.*

1. Introduction

One of our nation's best performing industries, farming is essential to the expansion of our economy. Fruits of excellent grade are in great demand due to our nation's expanding population. Agricultural produce is handled in many ways, including cutting fruits and vegetables from the farm, "washing, sorting, grading, packing, transporting, and eventually storing". Sorting and grading are significant processing which is responsible for protecting the quality of fresh-market items. The texture or exterior appearance of fruits is used to sort agricultural goods.

On the other hand, grading is done based on the overall qualitative aspects of a fruit by taking into account. A variety of qualities such as size, shape, color, and so on. The fruit industry is becoming increasingly discerning, with providers being required to provide superior quality and appearance products. As a result of the growing demand to offer high-quality fruits in a short amount of time, there is a heavy demand of automated fruit grading systems.

India is a rapidly developing country, and cultivation is the strength of the country's early development. The ground is come across encounters as a result of urbanization and globalization principles. Also, knowledge of the need for cultivation must be fostered in the minds of the younger generation. The importance of innovation in the modern world is crucial in many disciplines, yet we still rely on outdated methods in agriculture. A mistaken diagnosis of plant disease results in a significant loss of output, time, money, and product quality. Segmentation approach utilized to be performed directly by trained personnel, but forecasting is becoming more challenging due to the various changes in the environment. As a consequence, vegetable grade can be determined using image processing methods. Due to a scarcity of resources, such as human resources, the quality of fruits then vegetables is now an essential factor, besides grading based on quality is a critical responsibility. The grading procedure will be automated using Computer vision-based technology. The main area of this approach is to use a deep learning algorithm to sort onions by color and quality.

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Hybrid Algorithms based Software Development System using Artificial Intelligence for the Business Development

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***Abstract*— In this essay, we look at how to provide a product to a consumer as quickly as possible without compromising its quality. We'll show how putting six continuous architectural principles into practise will help us ensure the quality of the finished project while shortening the manufacturing cycle. Prior to reducing costs, it's important to provide the things as fast as feasible. We can do this by using a variety of strategies, such availability plans, that enable us to maintain the greatest levels of quality, just as the software team was able to. He talks about these approaches, as well as a few more, for delivering top-notch printer software designs quickly. India has a big food-related industry. principal means of support. In this essay, I want to look at how to provide items to customers as quickly as possible without sacrificing product quality. Even while making enhancements, we will consider how the six comparable design components may ensure that the finished product has the highest possible quality in the shortest period of time possible. Giving excellent goods quickly and doing them effectively are both essential. To do this, we may use a range of strategies, such as unavailability techniques, which enable us to maintain the highest level of accuracy that our team of engineers is capable of. He discusses these methods and a few options for the goods' distribution. Using this stock market idea, growers can sell their goods at the highest bidder pricing. Farmers that fill out this form may register themselves and have access to a variety of facilities, such as market alerts, merchant engagement, assessments, and more. The creation of knowledge devices, automated weapon systems,[1] language comprehension, computer vision, legal analysis, and agricultural monitoring are just a few examples of the many uses for data modelling. The problem of the expanding global agricultural output will be addressed by the employment of AI in contemporary agriculture. Based on AI, it should be easy to recognise and quickly identify plants, and judgments on the appropriate chemical to apply and the necessary safe zone might be made quickly. The majority of residents in this area rely on agricultural products for the majority of their income, which is good for the whole neighbourhood. Farmers are in responsible of growing the food that is required for a healthy lifestyle. Choosing the right market value for the shares they are providing is a challenge for the sales reps. The costs of this corporation considerably outweigh its profits previously mentioned concept of share pri permitted to offer their goods at the highest l extra services available to farmers who joi assessments, supplier relationships, market u other advantages and features of a similar kind. Data analytics has several applications, including as a tool of knowledge.**

Keywords: AI, Business Development, Hybrid Algorithm, OOSE, Neural Network, CNN and XBLR.

I. INTRODUCTION

Prototypes are one of the life cycle pattern kinds for software development that are most often utilised. Many businesses that make software use the testing approach. The progressive model is often the order of steps utilised [2] when a customer submits a large-scale programme with the intention of completing it rapidly. The evolved life cycle approach is favoured over other life cycle methods because it enables us to continually develop the system given to the client while maintaining the basic minimums, or, to put it another way, the essential qualities of the product. For the application developers and the company, it is very problematic when the customer is unsure of his requirements and continuously altering them over time.

The life-cycle model is also employed well in modelling inside the software development business. Companies and organisations that create software often use prototyping. When a customer requests a speedy turnaround on a significant project, the up is often employed in connection with the life cycle idea. The transformational model [3] was chosen above other available models because it only includes the most basic elements, which we should really refer to as the item's essential components, and enables us to continue working on the building even after it has been delivered to the customer. When the consumer is unsure about their wants and often changes them, the programmers and the company face significant challenges. There will be a significant investment of resources, including time, energy, and labour. They should easily be able to introduce new items using OOSE since the new variables will absorb the key characteristics of the existing ones. Although the courses with either a solid item are restricted to carrying out their particular designated goal,

› apply such elements in the construction of
Device agile development (Central Board of
tion) is useful in this situation. It enables us
mputer system using the stock components.
:tive [4] is to build the system using pre-
ents and integrating them rather than

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Create an Innovative Intrusion DetectionSystem for the Internet of Things by Improving Feature Weighting Through Heuristics

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Submitted: 04/12/2023 **Revised**: 14/01/2024 **Accepted**: 25/01/2024

Abstract: Recently, the "Internet of Things (IoT)" industry has developed as a tool for developing intelligent models of operation. Real-world applications that rely on the IoT system view privacy and security as major issues. Security issues in IoT-enabled devices pose obstacles to progress in the smart economy. As a result, "Intrusion Detection Systems (IDSs)" tailored to the IoT industries are desperately needed to curb the escalating number of attacks based on the Internet of Things. Because of their limited processing power, memory size, and battery life, traditional IDSs cannot be used in broad IoT-aided networks. Several IDSs have been proposed in academic publications as potential solutions to these issues. However, many IDSs run into problems with false positives and false negatives when looking for anomalies. Inorder to detect intrusion in the IoT industry and fix the problems with traditional systems, a deep learning ensemble model is suggested. In the first stage, we obtain the raw data from established sources.Consequently, the model is verified usingcomplementary metrics. The proposed approach, on the other hand, not onlyovercomes the greater detection rate, but also aids in avoiding intrusion from thirdparties.

Keyword: *Ensemble Networks, IoT Intrusion Detection Systems, and the Internet of Things.*

1. Introduction

The term "Internet of Things" (IoT)is used to describe the global network ofelectronic devices that can gather and share data through the use of built-in sensors, processors, and network connections. While there are many upsides to the Internet of Things, there are also some security concerns. Protecting Internet of Things (IoT) infrastructure from threats like hacking, data breaches, and other hostile actions relies heavily on intrusion detection systems. Inorder to identify security threats, intrusion detection systems (IDS) analyse data from all devices and traffic on a network. Due to resource limits, heterogeneity, and changing topologies in IoT networks, traditional IDS approaches generally fall short in IoT contexts. Due to its ability to automatically learn complicated patterns and features from massive volumes of data, deep learning has emerged as a potential solution for intrusion detection in IoT. In order to detect intrusions in the Internet of Things using deep learning, artificial neural networks are trained to examine data from sensors and other sources. Deep learning models can detect anomalous behavior, identify attempted intrusions, and categories threats by learning from past data. In conclusion, deep learning-based intrusion detection in

Things has considerable potential to strengthen IoT network and device security. As research and development in this area proceeds, it willlikely play an increasingly important role in safeguarding the security, confidentiality, and privacy of Internet of Things (IoT) infrastructure.

There are a number of obstacles specific to intrusion detection in the IoT that must be overcome to assure adequate safety.The limited processing power, memory, and energy resources of many IoT devices is justone of the major obstacles. It can be difficult to implement resource-intensive intrusion detection algorithms on such devices. To getbeyond these restrictions, effective methods like slimmer models or distributed computing need to be created. The devices that make up an IoT network can be made by a number of different companies and run a wide variety of software and communication protocols. Due to the wide variety of devices and communication protocols, it is challenging to create a unified intrusion detection system. For successful intrusion detection across various IoT devices, it is necessary to solve

compatibility and interoperability difficulties. Adversarial assaults, in which an attacker manipulates ick the detection model, can compromise based intrusion detection systems. False alse positives caused bymalicious attacks 's ability to protect a network. It is a huge ate deep learning models that are both

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Onion Classification using Color and Convolutional Neural Network

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Submitted: 14/09/2023 **Revised**: 28/10/2023 **Accepted**: 12/11/2023

Abstract: One of the most critical processes in producing fruits and vegetables is sorting, which is typically done manually in most countries. Onion production is large-scale in India, mainly in Maharashtra's West Region. As a result, it would be more useful in the industry for sorting and grading onions. Food quality detection and grading have benefited from the machine learning application then computer vision techniques. The task of distinguishing infected/uninfected onions from images of their exterior surface is investigated using various methods. One of the supreme important economic sectors in our nation is agriculture and it shows a critical part in our country's economic growth. Agriculture fruits are processed by cutting them from their natural forms, washing, sorting, grading, packaging, and shipping. Grading of onion is a significant step for protecting the quality of fresh-market items. The exterior appearance of the fruits is used to sort agricultural goods. Shape, size, and color are used to grade the items. In this study, HSV ranges are used to categorize onions into red and white colors. A convolutional neural network is also used to categorize the onion pictures into good and damaged quality.

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Framework for Detecting Malicious Activity in Vehicular Ad hoc Network

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Abstract: Vehicular Ad Hoc Networks (VANETs) have the capability of swapping every node of every individual while driving and traveling on the roadside. The VANET-connected vehicle can send and receive data such as requests for emergency assistance, current traffic conditions, etc. VANET assistance with a vehicle for communication purposes is desperately needed. The routing method has the characteristics of safe routing to repair the trust-based features on a specific node.

When malicious activity is uncovered, intrusion detection systems (IDS) are crucial tools for mitigating the damage. Collaborations between vehicles in a VANET enhance detection precision by spreading information about interactions across their nodes. This makes the machine learning distribution system feasible, scalable, and usable for creating VANET-based cooperative detection techniques. Privacy considerations are a major impediment to collaborative learning due to the data flow between nodes. A malicious node can get private details about other nodes by observing them. This study proposes a cooperative IDS for VANETs that safeguards the data generated by machine learning. In the intrusion detection phase, the selected optimal characteristics is used to detect network intrusion via a hybrid Deep Neural Network and Bidirectional Long Short-Term Memory approach. The Trust-based routing protocol then performs the intrusion prevention process, stopping the hostile node by having it select the most efficient routing path possible.

Keywords: Vehicular Ad Hoc Networks (VANET), Security Algorithm, Intrusion Detection Systems (IDS), Machine learning.

I. INTRODUCTION

Internet technology and cyl
are currently penetrating all areas of
technology paradigms are being cha

and device automation is transitioning to devise autonomation. The transport communications area is not an exception. A new type of machine-to-machine (M2M) telecommunications has been formed, a self-organizing wireless ad-hoc networks with dynamic topology, e.g. VANET, the intercar network; FANET, the network between aerial drones; and MARINET, the network between autonomous vessels. M2M network supports multiple sustainable links between the hosts and ensures the dynamic routing management at each host [1].

For instance, mobile ad hoc networks (MANETs) include the subset known as vehicular ad hoc networks (VANETs). Where it is created by roving or parked hives of mobile computers linked via wireless [2].

The European Transportation Policy identifies Intelligent Transport Systems as a critical technology for enhancing the transport sector's commitment to safety, efficiency, and environmental friendliness. Intelligent transportation systems rely on complex communication networks to gather information from the many parts of the transportation network. Users of the transit system and the transit authority benefit from the data processing and translation into relevant information and recommendations. The term "vehicular network" is widely used to refer to this type of complex communication system [3].

:cting vehicles in the future will allow
deployment of extremely mobile
vith the availability of historical data
ic and utilisation trends detected by

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Optimal Attack or Malicious Activity Detection in VANET Using Ensemble Machine Learning Approach

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Submitted: 03/12/2023 **Revised**: 15/01/2024 **Accepted**: 26/01/2024

Abstract: In a Vehicular Ad-Hoc Network (VANET), a large number of moving and stationary automobiles form a wireless network. It's a cheap and straightforward way to get data on traffic and cars to command centers. VANET employs a set of protocols to safely transmit data and connect vehicle nodes to the internet. It's not uncommon for VANETs to make use of the Ad-hoc on-demand Distance Vector Protocol (AODV). It is a machine language paradigm that requires minimal processing time and memory. OBUs on vehicles carry out the necessary protocols and procedures for sending messages between vehicles, while RSUs are the fixed links that allow vehicles to communicate with one another. When multiple vehicles transmit data on a single vehicle at the same time, some of the data may be garbled or lost. However, the nodes' roles shiftregularly, making routing difficult when a vehicle's software or hardware fails. New attack detection in VANET is developed to address the aforementioned problems. At first, we compiled the information from several online resources. Data cleansing is the process of scrubbing information of duplicates or irrelevant details. By contrasting the results of the developed machine learning-based attack detection in VANET with those of previously established methods and algorithms, we can verify the effectiveness of the latter.

Keywords: *Malicious Activity Detection, Vehicular Ad-Hoc Network, Ensemble Machine Learning Model.*

1. Introduction

In a Vehicular Ad-Hoc Network (VANET) [9], for example, automobiles connect to one another by Road Side Units (RSUs) and On-Board Units (OBUs), making it a type of Mobile Ad Hoc Network (MANET). The Onboard Bus Unit (OBU) implements communication protocols and techniques in cars, allowing them to communicate with one other through predetermined routes or other locations connected to roadways (RSU) [10]. Roadside units (RSUs) are secure infrastructure pieces that have communication tools installed so they can receive data from automobiles. More specifically, RSU can be installed at intersections, on roadside barriers, or at traffic lights [11]. The foundation of an Intelligent Transportation System (ITS) is any vehicle that can start and stop communicating depending on the information that has to be exchanged [12]. With the advancement of ITS communication technology, VANET is a concept in its early stages of development. An essential component of smart city infrastructure, VANET integration with mobile apps is delivering web apps over the internet while simultaneously increasing bandwidth and decreasing latency [13]. Vehicles participate in data analysis using cloud computing by acting as nodes and contributing computing power [14]. In addition, VANET provides a range of cloud services, including as computation and storage, from the vehicles' locations, which helps to minimize backbone network congestion and delay [15]. Hence, VANET opens doors to capitalizing on big data for a range of smart city uses, including infotainment, real-time traffic monitoring, and surveillance [16]. At the same time, since VANET connections necessitate engagement and cooperation between cars and other cloud entities, this makes them attractive targets for attackers.

1.1 VANET has a distributed

It is the responsibility of the infrastructure to ensure that all security parameters are properly managed while data is exchanged between the dispersed nodes in the vehicular network. VANET security characteristics such as authentication, integrity, and availability are susceptible to numerous attacks, such as Distributed Denial-of-Service (DDoS), Sybil Attack (SA), Man-In-The-Middle (MITM), and jellyfish attacks [17]. To make the ad hoc vehicular system more secure and efficient, it is necessary to provide a way to detect and block all of these harmful attacks in the network, taking into account all of the dangers in the VANET [18]. Every year, DDoS assaults take new forms and target different resources, such as system ork bandwidth, and others. That being ary danger to system availability is a ial of service attack [19]. Developing a ndable, and strong network intrusion m to effectively combat distributed

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Swarm Optimization Framework for Energy-Efficient Allocation of Industrial IoT Resources

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***Abstract*—The IIoT, or Industrial Internet of Things, has recently emerged as a major topic of discussion in the context of technological innovation in the manufacturing sector. The IIoT lends a hand in production by promoting and implementing smart sensors or devices for use in industrial systems. Although it demonstrates an astonishing process, it still raises difficult questions about how to make the nodes more energy efficient and how to fairly distribute the available resources among them. Earlier models were used, but they were hampered by issues like a single communication route and artificial constraints. But congested communications, scarce materials, and power outages are the biggest stumbling blocks. Because of this, there is a need for a more efficient IIoT model that can improve the gearbox. To address the difficulties of the traditional methods, this paper proposes a new energy-efficient resource allocation model for the IIoT. The difficulties of channel estimation will later be reduced by employing energy efficiency requirements. Finally, system energy efficiency will be improved, resulting in an effective resource allocation rate.**

***Keywords*— Swarm optimization; power and channel resource allocation; energy efficiency in the industrial IoT.**

I. INTRODUCTION

The Industrial Internet of Things (IIoT) is a subset of IoT that emphasizes the use of IoT technologies in industrial settings. There is currently a widespread deployment of smart sensors [9] that can be networked together and share data over the IoT network. Meanwhile, the IIoT incorporates servers and other mechanical equipment to boost efficiency. Factory and other industrial facility health can be monitored with devices containing "Wireless Sensing Devices" (WSDs). Since data must be transmitted, processed, and stored simultaneously, these applications require more resources, particularly energy. With the help of modern technology, data is beneficial for completing a wide variety of tasks in a timely and effective manner [11]. Today, IIoT is being given a great deal of focus and importance in the urban sphere, the manufacturing and transportation sectors, the medical domain, and other industrial spheres. As a result, for the technology and its industrial applications to flourish, th[illegible] function effectively [12]. The IIoT is stuc[illegible] catering to high-quality results and organizing itself, despite its advanced knowledge of reliability and adaptability. Storage and hosting of data in the cloud is another challenging task. Using widespread infrastructure and local conditions boosts the efficiency of the system [13]. Network congestion slowed data transfer, and excessive energy consumption are only some of the issues that will occur [14]. In order to maximize power savings and resource utilization, professionals in this industry have implemented a number of different tactics for IIoT networks.

Since the IIoT business is experiencing rapid demands for extensive involvement and its services, energy consumption and communication overhead have become critical challenges to consider [15]. The IIoT network differs from the IoT in several ways, including delay, cost or benefit, efficiency, privacy, security, and so on [16]. Therefore, it is crucial that the system be constructed effectively, making the most of available energy and capacity while also addressing the problem of limited supplies. Energy consumption is challenging to control in a large network such as IIoT [17]. A key cause of system degradation [18] is the inefficient utilization of the network's abundant resources. The computerized model makes use of cloud-based information for its process, but it still suffers from issues including slowness, latency, and insufficient storage [19]. Edge computing tasks deployed across an industrial network can assist in solving some problems. Several academic disciplines contributed to the development of the many energy-saving methods currently in use. However, there are issues with the system that must be fixed, including latency, stability, and structural complexity [20].

The "Medium Access Control (MAC)" [21] is used by IEEE 802.15.4 to facilitate smoother communication between the coordinator and the devices. Of course, the superframe is referring to the time axis, which shows when exactly data transmission events occur [22]. Edge computing-based IIoT installations have benefited from the system's efficient [illegible] on and computation offloading. The

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