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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

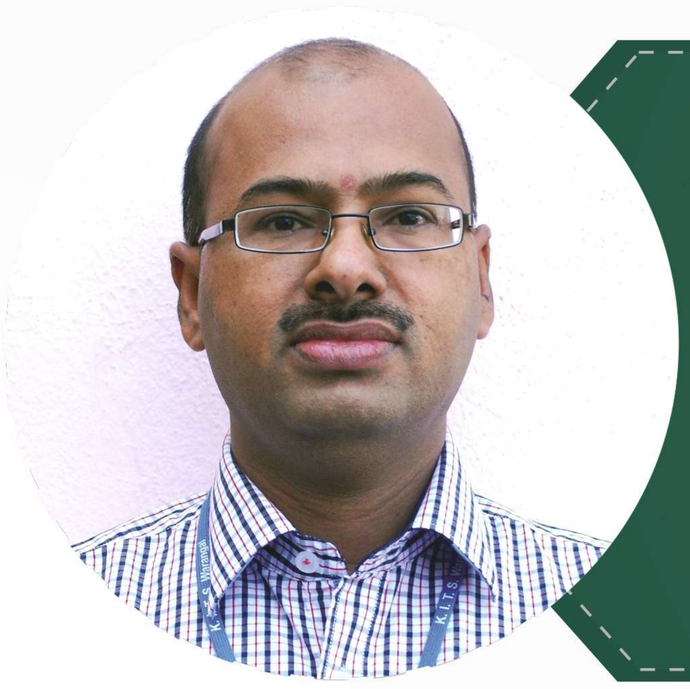
roCkSE

Valume No. XIII // August - 2022

VIEWS

It gives me immense pleasure to know that the next issue of newsletter is ready. I congratulate all those who have contributed in bringing this out. I appreciate the efforts of the editor board in collecting the information related to this newsletter.

Dr. K. Ashoka Reddy
Principal, KITSW



It's a pleasure to announce the release of focus which majorly comprises articles with the updates in the latest technology. The unique feature of this newsletter is that it is being planned and designed by the students.

Dr. P. Niranjan
Prof. & Head
Department of CSE

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Presents...

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A Technical Magazine

Valume No. XIII //
August - 2022

CONTENTS

TECHNICAL MAGAZINE CONTENTS

VISION AND MISSION OF THE DEPARTMENT

PEO's, PO's & PSOs - FOR UG AND PG

PAPERS IN JOURNALS & CONFERENCE PROCEEDINGS

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VISION

- Attaining centre of excellence status in various fields of Computer Science and Engineering by offering worthfull education, training and research to improve quality of software services for ever growing needs of the industry and society.

MISION

- Practice qualitative approach and standards to provide students better understanding and profound knowledge in the fundamentals and concepts of computer science with its allied disciplines.

- Motivate students in continuous learning to enhance their technical, communicational, and managerial skills to make them competent and cope with the latest trends, technologies, and improvements in computer science to have a successful career with professional ethics.

- Involve students to analyze, design and experiment with contemporary research problems in computer science to impact socio-economic, political and environmental aspects of the globe.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- Graduates with fundamental knowledge should escalate the technical skills within and across disciplines of Computer Science Engineering for productive career by maintaining profesional ethics
- Graduates should develop and exercise their capabilities to demonstrate their creativity in engineering practice and exhibit leadership with responsibility in teamwork.
- Graduates should refine their knowledge and skills to attain professional competence through life-long learning such as higher education, research and professional activities.

PROGRAM SPECIFIC OUTCOMES (PSOs):

- **Software Development and Quality assurance**
  Transform various legacy or manual systems into computer automated systems using Modern Programming Languages, Integrated Development Environments, and apply Testing Tools for efficient verification and validation of those software systems.
- **Maintenance**
  Demonstrate knowledge in fixing and updating multidisciplinary software problems working in real time environment.
- **Immediate professional practice**
  Work as a software practitioner or continue higher education by adopting advanced technologies in various fields of computer science and Engineering.

PROGRAM OUTCOMES(POs) : B.TECH

- **Engineering knowledge** : Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- **Problem analysis** : Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **Design/development of solutions** : Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **Conduct investigations of complex problems** : Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
- **Modern tool usage** : Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

- **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

- **Environment and sustainability** : Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

- **Ethics :** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

- **Individual and team work** : Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

- **Communication** : Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

- **Project management and finance** : Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

- **Life-long learning** : Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM OUTCOMES (POs): M.Tech

- Engineering Knowledge: An ability to independently carry out research/ investigation and development work to solve practical problems.
  Problem Analysis: An ability to write and present a substantial technical report / document.

- Design/Development of solutions: Students should be able to demonstrate a degree of mastery over as per the Specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

PROGRAM SPECIFIC OUTCOMES (PSOs): M.Tech

- Software Development and Quality Assurance: Apply the Knowledge and current technologies of software engineering to Pursue Research over complex problems of Computer Science domains.

- Maintenance: Equipped with the Industry Ready, Teaching Skills and Entrepreneur-ship Capabilities.

- Immediate Professional Practice: plan, manage and assess effectively the software products by using the Software Engineering Concepts and Methodologies.

Journal of educational and social research
Volume VIII Number II June 2022

Heart dısease predıctıon usıng hybrıd machıne learnıng techniques.

Dr. C. Srinivas[1], Arshanapalli Nikhitha[2], Dr. V. Chandra Shekhar Rao[1],Dr. Niranjan Polala[3], Dr. V. Shankar[3]

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[2]Student (M. Tech, SE)
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Abstract: Nowadays heart condition could be a leading explanation for death within the modern times. Predicting disorder could be a tremendous issue within the field of clinical information analysis. Machine learning (ML) has been found to be helpful in aiding with decision-making and prediction of huge amounts of information generated by the aid business. This paper describes a completely unique strategy for characteristic key options victimization machine learning techniques, that improves disorder prediction accuracy. The prediction model for cardiovascular condition with the hybrid model will manufacture Associate in Nursing improved performance level with Associate in Nursing accuracy level of 88.7 % (HRFLM).

Keywords: Heart Disease, Cardiopathy, Hybrid Random Forest linear model.

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An Adaptive Technique to Predict Heart Disease Using Hybrid Machine Learning Approach

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Abstract—cardiovascular disease is amongby far prevalent fatalities in today's society. Cardiovascular disease is extremely hard to predict using clinical data analysis. Machine learning (ML) hasproved to be useful for helping in judgement and predictions with the enormous amount data produced by the healthcare sectorbusiness. Furthermore, latest events in other IoT sectors have demonstrated that machine learning is used (IOT). Several studies have examined the use of MLa heart disease prediction. In this research, we describe a novel method that, by highlighting essential traits, can improvethe precision of heart disease prognosis. Numerous data combinations and well-known categorization algorithms are used to create the forecasting models. Using a decent accuracy of 88.7%, we raise the level of playusing a heart disease forecasting approach that incorporates a88.7% absolute certainty in a combination random forest and linear model. (HRFLM).

Keywords- Modeling heart disease, classifying cardiovascular diseases, and using machine learning and feature selection (CVD).

I. INTRODUCTION

blood cholesterol, Due to the numerous conditions that can raise the risk, like diabetes, pressure, high an increased heart rate, and many more, it can be difficult to recognise heart disease.In order to establish To determine the severity of cardiac disease in patients, a variety of data collection methods, including neural network algorithms, have been used. The K-Nearest Neighbour method is one of the techniques used it to classify the illness's severity.

In this study, a prediction framework was created by doing several readings, integrating at least two separate procedures, and applying different methods. The term used to describe these newly merged processes is hybrid approaches. 30% of the data are used for categorization and 70% are used for training when using a Network with radial basis functions (RBFN). In addition, we go over the application of computer-aided decision support systems (CADSS) in the scientific and medical communities. Data mining methods have been used to the healthcare industry previously, and it has been shown that they are capable of illness forecasting that is quicker and more accurate, resulting in lower medical errors and expenses.

II. LITERATURE SURVEY

A. Using a random forest classifier, the data mining model may predict the occurrence of coronary heart disease.

Authors:R. R. Rajalaxmi and A. S. Abdullah ,

Cardiovascular illnesses are a serious public health issue. Because they are so widespread, these diseases also cause a lot of fatalities. This study uses a Random Forests Classifier to examine the factors that lead to Coronary Artery Disease. The analysis showed that for each element, the suitable classification ratio and efficiency measure created vulnerability to coronary artery disease. Results from the performance measure make the effect of demographic traits on CAD abundantly obvious. Also, this work demonstrates how the random forests method may be utilised to process and categorise medical data like CAD.

B. The PSO algorithm produces the best criteria for heart disease diagnosis.

Authors: M. Abdar, I. Al Mansoori, M. Z. Moghadam, and A. H. Alkeshuosh Abstract: A significant worldwide health problem is cardiovascular disease. In the healthcare system, limited knowledge and experience in manual diagnosis results in faulty diagnosis, and the data about various ailments that are

Ensemble techniques for mental stress prediction

Sri. S. Naga Raju [1], Dr Nandam Gayatri[2],Sameer Mohammed[3], Sumana Sree Dandigam[4],Harsha Vardhan Adluri[5], Vijay Komma[6]

[1]AssociateProfessor,[2] Assistant Professor, [3,4,6,5]Students

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Abstract: Mental stress became a social problem and may contribute to functional impairment at regular job. Chronic stress may also be a factor in a number of psychophysiological illnesses. Stress, for instance, raises the risk of heart attack, stroke, and depression. According to the most recent research in neuroscience, brain is the ultimate target of the stress since how the brain perceives a situation affects how harmful and stressful it is. In this situation, a measurement that is objective and takes into account the human brain could greatly reduce the negative impacts of the stress. A machine learning (ML) framework using the ECG and EMG of participants who are stressed is therefore suggested. The task performance and subjective feedback supported the induction of stress. The framework for suggested ML included feature selection, extraction, and classification The findings demonstrated that the suggested framework increased the accuracy of stress recognition. The suggested approach may contribute to the creation of the computer-aided diagnostic tool for stress prediction.

Keywords: 1.Machine Learning, 2.Ensemble Technique, 3.Decision Tree, 4.Gaussian NB, 5.KNN, Voting.

I. Introduction

A popular definition of stress is a condition in which a person feels overly pressured to perform and is only just able to keep up with the obligations. These requirements may be societal or psychological. Psychosocial stress is a known component of daily living that negatively impacts people's emotional behavior, ability to function at work, and mental and physical health. Numerous physiological illnesses are mostly brought on by psychosocial stress. For instance, it makes depression, stroke, heart attacks, and cardiac arrest more likely.

Stress must first be quantified into levels in order to be treated. In clinical settings, subjective techniques like questionnaires and interviews have been used to assess stress. As an alternative, the stress related physiological and the physical changes are being used as quantifiable stress predictors. Physically, for instance, stress alters the pace of blinking, the size of the pupil, and facial expressions. Contrarily, stress results in modifications to the autonomic nerve system (ANS). Therefore, the HR and heart rate variability, therespiration, and the skin conductance are physiological indicators of stress from the ANS.

The brain is the basic target of the mental stress, according to the most recent findings of neuroscience, because it is the human brain that identifies if the situation seems threatening and also stressful too. The cortex to get the best tools for measuring functional changes in brain in theresponse to the stress are not invasive methods like electroencephalography (EEG). It's significant that EEGs have demonstrated an implied relationship with other stress predictors like HR and heart rate variability generally and specifically in stress.

Several electrophysiological properties from EEG signals have been retrieved by several research in order to quantify stress from the EEG signals, and also the classification algorithms are used with highest accuracy of 96% to distinguish the two levels of the stress. These findings support the idea that EEG can be used as a stress evaluation tool. Recent research has demonstrated that stress can alter connection parameters including coherence and mutual information as well as the absolute power of the EEG. Similar findings have been made regarding the impact of HRV biofeedback during stress therapy on asymmetry in EEG alpha power. In another researchstudy, the EEG alpha asymmetry was explored, and the stressrelated issues were found in the virtual reality setting.

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LUNG DISEASE DETECTION AND CLASSIFICATION USING DEEP LEARNING APPROACH

Swapna Saturi1, HarshithaGutam2, Mididoddi Ramakrishna3, SamalaSharvan4, Mulkanooru Rushivardhan5, Rekha Gangula6
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ABSTRACT

Today, the outbreak of COVID-19 as well as respiratory problems kill a great deal of people world-wide. In this study, we investigate applying deep learning (artificial intelligence) and VGG16 models to identify and categories a variety of lung disorders from chest X-ray pictures. Convolutional neural networks (CNNs) have demonstrated remarkable potential as a quick and effective way to diagnose various lung diseases such as COVID-19 infection, pneumonia in humans. CNNs can properly classify objects and scenes in photos because they are able to learn and recognize patterns in visual data by examining several layers of data.

Keywords: Covid 19,VGG16, CNN, Lung cander

I. INTRODUCTION

COVID-19, also known as the novel coronavirus, is a highly infectious respiratory disease that has swept across the globe since its emergence in late 2019. The virus is primarily spread through respiratory droplets, and symptoms can range from mild to severe, including fever, cough, and difficulty breathing. One of the key challenges in controlling the spread of COVID-19 is the ability to quickly and accurately identify infected individuals. Traditional methods of detection, such as PCR tests, can be time-consuming and require specialized equipment. As a result, there has been a growing interest in using computer-aided methods for COVID-19 and pneumonia detection. One such method is the use of convolutional neural networks (CNNs), which is a type of artificial intelligence (AI) algorithm commonly used in image recognition tasks. CNNs are able to learn and identify patterns in visual data by analyzing multiple layers of information, allowing them to accurately classify objects and scenes in images [1].

In the context of COVID-19 and pneumonia detection, CNNs can be trained on X-ray of the lungs to identify the characteristic signs of the virus. To train a CNN for COVID-19 detection, a large dataset of X-raymust first be collected. These images must be labeled with the presence or absence of COVID-19, allowing the CNN to learn the distinguishing characteristics of the virus. Once the CNN has been trained on this dataset, it can be applied to new images to classify them as positive or negative for Pneumonia and COVID-19.

II. LITERATURE SURVEY

There are many previous researchers who had worked on network intrusion detection system. At first in the year of 1980 Anderson introduced this intrusion detection method to detect the anomaly attacks. Then after the evolution of machine learningresearchers started using machine learning techniques to detect the anomaly attacksandforbetterefficiency.

- In 1980, Anderson introduced anomaly-based using intrusion detection to look for unusual activity. Many researchers then utilize machine learning to made some advance mentsinthisareabydetectinginfiltrationalthought hedetectionrateinthewassomewhathigher five classes are categorized.
- Intheyear2014aresearchernamedKaungatalprop osedamethodologycombinedwithgeneticalgorit hmandsupportvectormachine.In the year 2014 two researchers named Inger and Yadav proposed a methodologyusingKNNwhichwas betterthanthepreviousmethods.
- Laterin theyear2016 two researchers named Farnaz and Jabbar proposed a methodology using Random Forest to detect the anomaly attacks.
- A researcher named Nadiammai proposed a methodology using semi supervisedmachine learning to detect the anomaly attacks. A researcher named Panda usedclassification and clustering for data filtering. They tested NSL KDD dataset using decision tree and confirmed that it doesn't work for multi class classification
- Are searcher named Sangkarsanee proposed a methodology using supervised machine learning techniques to detect the anomaly attacks and confirmed that it can identify only probe and DoS attacks.
- Yu and Campos proposed a methodology and said that by analyzing the local features anomaly detection is possible. Researcher Levent proposed a methodology using naive Bayesto identify the intrusions, and anomaly detection is possible using hidden naïve bayes and mentioned that DoS attacks accuracy is much

AN EFFICIENT WAY TO PREDICT STOCK PRICE USING LSTM-RNN ALGORITHM

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Abstract—Stock price prediction is a challenging and important task in finance. Machine learning algorithms have shown promise in predicting stock prices, with the ability to analyze large datasets and identify complex patterns. This study presents a comprehensive study of machine learning algorithms for stock price prediction. The proposed approach uses a variety of machine learning algorithms, including decision tree, random forest, support vector regression, and artificial neural networks. The models are trained on historical stock price data and evaluated using real-world data from various companies. This study calculates the RMSE, Error rate and the closing price of the stock for that day.

Keywords—Open, Close, Adjusted close, LSTM, Time Series, RMSE

I. INTRODUCTION

In the contemporary world, it is seen that there is an abrupt increase in growth of stocks exchange over the past decade outrageously. Inventory estimates can be generated accurately from the huge revenue for customers. The art of inventory cost forecasting was been a daunting task researcher in investment and analysts[8]. Predicting the almost nearest value of the stock can be done by considering the past data insights. There are many intricate financial indicators which determine the stock market's fluctuations which are very erratic in nature. For a large and successful investment, many traders strive to understand the patterns of the stock market. The best and powerful stock market forecast structures help traders, traders and analysts to offer supporting data as target path of stock market[10]. There are some complex economic signals, and on top of that, stock market swings are extraordinarily violent[1]. However, as the generation progresses, the chance to benefit from a regular gain in the stock market multiplies, also allowing professionals to discover the maximum information signals to make a better prediction. Nevertheless, as technology advances, the likelihood of making a stable prosperity from the stock market is developed which aids professionals in identifying the most telling indicators to make more accurate predictions. To maximize the profit from the acquisition of stock options while minimizing risk, the market value projection is crucial.

Machine learning and deep learning models are developed to predict the value of the stocks. In this project we will develop a model that meets the requirements based on observations from past data. Through a process of self-learning, deep learning algorithms[2] are able to find interesting insights and form the basis in the data. When it comes to the stock market, huge amounts of highly non-linear data are produced. We require models that can examine the underlying dynamics and hidden patterns in order to model this type of dynamical data. Through a process of self-learning, neural networks using deep learning are able to detect and take advantage of the linkages and patterns found in data. Deep learning models can accurately analyze various types of data and provide a good prediction by examining the relationships and discover trends within the data, unlike conventional methods.

II. LITERATURE SURVEY

According to the literature review, machine learning techniques[1][6][8] are being used extensively throughout the world to anticipate stock market movements. Comparing machine learning approaches to modern prediction methodologies, machine learning techniques are proven to be significantly faster and more accurate. They are CNN, ARIMA model, GAN model[11] which are previously used to determine the price of the stocks.

ARIMA[3] stands for AutoRegressive Integrated Moving Average which is a statistical model that is used for understanding, examining and estimating time series data. Some drawbacks of the ARIMA model include the assumptions about the data. The ARIMA model makes certain assumptions about the data, such as stationarity and normality. If the data does not meet these assumptions, the model may not be accurate. The ARIMA model has three parameters (p, d, q) that need to be chosen by the user. Selecting the appropriate values for these parameters can be difficult, especially for inexperienced users. The ARIMA model is based on linear relationships, so it may not be well-suited for modelling data that has non-linear relationships. The ARIMA model is designed to handle a single time series, so it may not be effective at modelling data with multiple input variables. The ARIMA model assumes that the data is complete and evenly spaced, so it may not be able to handle missing data or data with uneven spacing. Overall, the ARIMA model can be a useful tool for analyzing and forecasting time series data, but

CBES: A framework for Cloud-based E-learning System at SaaS Level

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Summary
Today, as we are living in the era of the Internet, the word "cloud" revolves around everyone. Cloud Computing is the concept that is implemented to provide high computing inexpensive infrastructure and software available on demand. The usage of cloud-based e-learning systems is increasingly becoming popular day by day and is gaining demand around the world. Almost all private and public educational institutions are adopting cloud computing for managing their learning resources. It provides easy anywhere easy access to its users but still the policies or methods to secure the cloud are still not developed properly. Truth worthiness is becoming critical for the future usage of Cloud-based e-learning systems (CBES). The paper discusses different advantages and weaknesses issues related to a CBES and finally proposed a framework that overcomes the different challenges for CBES at the SaaS level, thus increasing the levels of acceptance of using the CBES.
Keywords:
e-learning; Cloud Computing; Security; Cloud Policies; IAAS, PAAS, SAAS, CBES

1. Introduction

The changing world of Information Technology in this 21st century has a great impact on education. The future of tomorrow's technology directly depends on the adoption of technology by the students of this current era. The advancement of science and technology has changed the process of teaching and learning by creating many alternate methods for the same. The traditional way of teaching-learning does not support interactivity. Therefore, learners are losing interest in a traditional way of imparting knowledge, and it is no more in demand. E-Learning is an approach to learning by using electronic gadgets like computers, mobiles, laptops, iPad, etc. E-learning environments offer interactive features that increase the student's motivation for the learning process. It involves many to many interactions between its users by using the standards of web 2.0 and web 3.0. Almost all the university around the globe are transforming their traditional classroom-centered education into e-learning education by adopting cloud-based e-learning systems on their premises. Educational stakeholders (students and teachers) are getting more engaged in their teaching-learning process by adopting an e-learning environment that offers different learning styles. The e-learning system provides many advantages over the traditional education system. Better management of educational content, user performance, user assessment, cost-effective, more interactive, offers a variety of courses, user's attendance, user's authentication, availability of online experts, schedule flexibility, real-time 24 x 7 operations, a large number of audiences, increase knowledge retention, efficient in term of time, more freedom to ask questions, self-paced learning, pre-notification/alert, quick approach to the resources and easy access across borders. Nowadays, e-learning methodologies like gamification are used to improve the pedagogy in teaching-learning institutions.

Cloud Computing is the latest technology that offers dynamically highly scalable resources (hardware, operating environment, software) 24/7. It is a new internet-based technology that brought down the price of hardware infrastructure, software tools, and data processing and storage. Software in cloud computing is used to automatically aggregate computing resources and manage them [2-4]. The development of service-oriented architecture led to the development of cloud computing (SOA). Cloud computing may be summed up as a group of services that various consumers can request from a cloud service provider.

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Design and Development IoT based Smart Energy Management Systems in Buildings through LoRa Communication Protocol

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Abstract:
Energy management is a vital tool for reducing significant supply-side deficits and increasing the efficiency of power generation. The present energy system standard emphasizes lowering the total cost of power without limiting consumption by opting to lower electricity use during peak hours. The previous problem necessitates the development and growth of a flexible and mobile technology that meets the needs of a wide variety of customers while preserving the general energy balance. In order to replace a partial load decrease in a controlled manner, smart energy management systems are designed, according to the preferences of the user, for the situation of a full power loss in a particular region. Smart Energy Management Systems incorporate cost-optimization methods based on human satisfaction with sense input features and time of utilization. In addition to developing an Internet of Things (IoT) for data storage and analytics, reliable LoRa connectivity for residential area networks is also developed. The proposed method is named as LoRa_bidirectional gated recurrent neural network (LoRa_ BiGNN) model which achieves 0.11 and 0.13 of MAE, 0.21 and 0.23 of RMSE, 0.34 and 0.23 of MAPE for heating and cooling loads.

Keywords-Smart energy management, buildings, LoRa communication, data prediction, neural networks.

I. Introduction

The Internet of Things (IoT) is applicable in several sectors, including transit [1], healthcare [2], agribusiness [3], and electricity networks [4]. These IoT solutions seek to watch and manage many components and gadgets in a variety of situations to streamline duties and offer practical uses for everyday life [5]. Energy is a key component of the electric power infrastructure that powers our houses and equipment. But since determining a home's usage relies heavily on an electronic energy meter, utility companies must hire staff to carry out the necessary measuring duties each month in order to charge their clients [6]. Regarding device utilization inside a home, occupants might not be conscious of the specific power requirements for each appliance, leading to unknowingly wasteful energy usage. India has a target of installing 6.5 million smart meters by 2025 [7] in this respect. The major objective of this work is to employ smart meters to reduce energy usage by introducing new tariff structures, offering more comprehensive energy invoicing, and using displays through online interfaces and mobile apps.

The Internet of Energy, smart networks, and smart houses are just a few of the energy saving methods that the IoT will be crucial in allowing. This is made possible by the use of digital sensing and communication tools that enable a home energy management system (HEMS), which supports contact between the utility and the power infrastructure while allowing constant usage tracking and gadget control [8]. Data is collected through IoT devices and then sent to a cloud-based system architecture for analysis and storage [9]. The main components that may be designed and implemented in cloud-based infrastructure to meet the IoT cloud-based needs for a range of energy Internet apps are databases, file storage systems, and data-driven applications. The tasks are becoming more and more alluring to research institutions utilising the technologies that are now being developed when it comes to the construction of sensor networks [10]. The problem of electricity usage is growing at the same moment. The power source will last for months, years, or even decades when a network of devices is created. As a result, the issue of efficient energy management is one of reality, attracting the complete attention of both the scholarly and business communities.

Harvesting natural energy from the surrounding world is one way to make wireless sensing nodes more energy-efficient [11]. Many energy gathering sources of sustainable energy, such as thermal mechanical from the shaking of piezoelectric devices [12], solar sources [9], [10], sound wind, or energy generated from ocean waves [13], can be found in scientific study articles. These sources can be used

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Decentralized Machine Learning based Energy Efficient Routing and Intrusion Detection in Unmanned Aerial Network (UAV)

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Abstract

Decentralized machine learning (FL) is a system that uses federated learning (FL). Without disclosing locally stored sensitive information, FL enables multiple clients to work together to solve conventional distributed ML problems coordinated by a central server. In order to classify FLs, this research relies heavily on machine learning and deep learning techniques. The next generation of wireless networks is anticipated to incorporate unmanned aerial vehicles (UAVs) like drones into both civilian and military applications. The use of artificial intelligence (AI), and more specifically machine learning (ML) methods, to enhance the intelligence of UAV networks is desirable and necessary for the aforementioned uses. Unfortunately, most existing FL paradigms are still centralized, with a singular entity accountable for network-wide ML model aggregation and fusion. This is inappropriate for UAV networks, which frequently feature unreliable nodes and connections, and provides a possible single point of failure. There are many challenges by using high mobility of UAVs, of loss of packet frequent and difficulties in the UAV between the weak links, which affect the reliability while delivering data. An earlier UAV failure is happened by the unbalanced conception of energy and lifetime of the network is decreased; this will accelerate consequently in the overall network. In this paper, we focused mainly on the technique of security while maintaining UAV network in surveillance context, all information collected from different kinds of sources. The trust policies are based on peer-to-peer information which is confirmed by UAV network. A pre-shared UAV list or used by asymmetric encryption security in the proposal system. The wrong information can be identified when the UAV the network is hijacked physically by using this proposed technique. To provide secure routing path by using Secure Location with Intrusion Detection System (SLIDS) and conservation of energy-based prediction of link breakage done by location-based energy efficient routing (LEER) for discovering path of degree connectivity. Thus, the proposed novel architecture is named as Decentralized Federate Learning- Secure Location with Intrusion Detection System (DFL-SLIDS), which achieves 98% of routing overhead, 93% of end-to-end delay, 92% of energy efficiency, 86.4% of PDR and 97% of throughput.

Keywords- federated learning, machine learning, intrusion, energy efficiency, Unmanned aerial vehicles (UAVs).

I. Introduction

Major changes are occurring in the next iteration of wireless networks. By 2025, Cisco predicts, there will be more than 75 billion Internet of Things (IoT) devices [1], including sensors, wearables, smartphones, linked automobiles, and UAVs. This shift is fueling an explosion in the quantity of wireless data being transmitted between the many different kinds of linked devices. UAVs, also known as drones, are expanding rapidly in this setting due to their many useful uses in wireless networks [2] [3]. They range from military and telecommunications to hospital supply delivery and surveillance and monitoring. Due to their unique qualities, UAVs in particular can serve as providers of wireless network infrastructure, improving the capacity, coverage, and energy economy of these networks. Remote sensing, augmented reality, and package transportation are just some of the uses for UAVs, which can also function as aerial users of the current wireless infrastructure. In reality, the requirements and needs of these new applications are shifting [4].

UAVs-based wireless networks must provide low-latency and ultra-reliable services to keep up with the ever-changing needs of their end users [5], in addition to the high data rates that have been the primary prerequisite of traditional wireless networks over the past decade. For instance, in order to allow for real-time, low-latency management of autonomous drones, it is necessary to set up highly reliable communication links [6]. The amount of time that UAVs can stay in the air depends on many factors, including the UAVs' energy reserves, speed, altitude, trajectory, etc., and is therefore crucial to the successful implementation of such uses. However, Machine Learning

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Secure Energy Aware Optimal Routing using Reinforcement Learning-based Decision-Making with a Hybrid Optimization Algorithm in MANET

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Abstract

Mobile ad hoc networks (MANETs) are wireless networks that are perfect for applications such as special outdoor events, communications in areas without wireless infrastructure, crises and natural disasters, and military activities because they do not require any preexisting network infrastructure and can be deployed quickly. Mobile ad hoc networks can be made to last longer through the use of clustering, which is one of the most effective uses of energy. Security is a key issue in the development of ad hoc networks. Many studies have been conducted on how to reduce the energy expenditure of the nodes in this network. The majority of these approaches might conserve energy and extend the life of the nodes. The major goal of this research is to develop an energy-aware, secure mechanism for MANETs. Secure Energy Aware Reinforcement Learning based Decision Making with Hybrid Optimization Algorithm (RL-DMHOA) is proposed for detecting the malicious node in the network. With the assistance of the optimization algorithm, data can be transferred more efficiently by choosing aggregation points that allow individual nodes to conserve power The optimum path is chosen by combining the Particle Swarm Optimization (PSO) and the Bat Algorithm (BA) to create a fitness function that maximizes across-cluster distance, delay, and node energy. Three state-of-the-art methods are compared to the suggested method on a variety of metrics. Throughput of 94.8 percent, average latency of 28.1 percent, malicious detection rate of 91.4 percent, packet delivery ratio of 92.4 percent, and network lifetime of 85.2 percent are all attained with the suggested RL-DMHOA approach.

Index Terms:- MANET, malicious nodes, Lifetime, Optimal routing, energy, decision making.

I INTRODUCTION

A Mobile Ad Hoc Network (MANET) is a group of two or more wireless devices that may dynamically create a network to exchange data without depending on any established infrastructure [1]. All nodes in such a network operate as routers or hosts, and the connection between them may change over time as nodes are added and removed [2]. MANETs offer a number of benefits over conventional networks, including the ease with which they may be put up and destroyed [3]. The mobile nodes in MANETs have a limited amount of battery power, so the energy supply for such communication devices is mainly reliant on rechargeable batteries. As a result, having an energy reserve becomes a requirement for MANET activities to run smoothly [4].

The dynamic character of the nodes' motion uses up a lot of the available energy. The node's lifetime, and by extension the network's lifetime, is prolonged when energy loss is decreased [5]. When a link between networks fails, unnecessary energy is lost. Because of the need to improve throughput and increase the nodes' residual energy lifetime, this consumption has an effect on network efficiency. As a result, it drives us to suggest a method for extending the network's lifespan by lowering energy consumption for routing [6]. The mobile nodes may be clustered into clusters to enhance the network lifespan, which is a feasible strategy to improve network stability and scalability.

The Cluster Head (CH) is an essential requirement to examine since the CH will serve as the architecture's co-coordinator [7]. By updating the routing tables following topological changes, it reduces routing overhead. The CH's job is to control the nodes in its own cluster and interact with other clusters while using the least amount of transmission power possible by preventing packet flooding [8]. Due to their dynamic structure and each node's role as a router, MANETs are not always reliable. It is also not assured that the path between two nodes is clean of malicious nodes. Link attacks can severely disrupt communications over wireless links between locations. Security in MANETs may suffer from limited resources [9]. Certain encipherment and decryption procedures require intensive computation to complete. A security solution addressing authentication, confidentiality, integrity, non-repudiation, and availability can be built on the foundation of the identified weaknesses and characteristics.

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A bi-directional Long Short-Term Memory-based Diabetic Retinopathy detection model using retinal fundus images

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ABSTRACT

Images of the retina are widely used for diagnosing fundus disease. Low-quality retinal photos make it hard for computer-aided diagnosis systems and ophthalmologists to make a clinical diagnosis. In ophthalmology, precision medicine is based partly on the quality of retinal images. Diabetic Retinopathy (DR) is a common complication of diabetes mellitus that causes iris damage. It is difficult to detect and, if not detected early, can result in blindness. Convolutional neural networks are gaining popularity as an effective deep learning (DL) approach for medical image analysis. This study suggests using deep learning approaches at various stages of the fundus image-based diagnostic pipeline for diabetic retinopathy (DR). Many fields, including medical image classification, have adopted DL representations. Using retinal fundus images, we propose a bi-directional extended short-term memory-based diabetic retinopathy detection model. By examining images of the retinal fundus, the Bi-directional Long Short-Term Memory (LSTM) method can detect and classify various grades of DR. As a preprocessing step, the proposed model uses the Multiscale Retinex with Chromaticity Preservation (MSRCP) method to increase the difference of fundus pictures and progress the short difference of medicinal views. To prepare satisfactory results for image processing, multiscale retinex with chromaticity preservation is used. However, choosing the parameters' values, such as the Gaussian scales, gain, offset, etc., is the main difficulty with the retinex algorithm. To achieve a practical effect, these parameters must be adjusted. The main goal of the suggested method is to obtain the ideal values for the parameters used in the MSRCP algorithm. Also, photos that have already been processed are used to make feature vectors with the help of an efficient net-based feature extractor that uses deep learning. Many experiments use the benchmark Methods to Evaluate Segmentation and Indexing Techniques in the Field of Retinal Ophthalmology (MESSIDOR) dataset. The results are analyzed in terms of various evaluation factors. The results show that the Bi-LSTM-MSRCP technique is better at diagnosing DR than more modern methods.

1. Introduction

A microvascular complication of both type 1 and type 2 diabetes is diabetes retinopathy (DR). One of the leading causes of blindness worldwide, DR results in irregularities in the retina. DR affects approximately 33% of diabetics, and nearly all diabetics will develop it over time. DR is expected to affect 191 million people by 2030. The vascular structure of the retina is significantly altered by diabetic retinopathy. These changes impact the primary plasma pathways responsible for supplying oxygenated plasma and nutrients to the retina's different areas. Plasma containers can swell and leak fluid in some people who have diabetic retinopathy. This can lead to irregularities such as firm and lenient exudations being formed in the eye. In some situations, abnormal novel plasma containers grow, plasma containers occlude, and bleeding (hemorrhages) occurs in a substantial part of the cornea. This condition is referred to as choroidal neovascularization. To correctly recognize diabetic retinopathy, it is essential to accurately identify all potential abnormalities, including hard and soft exudates, hemorrhages, and obstructions of plasma containers.

In clinical practice, fundus examination is used to diagnose DR early. An electroretinography (ERG), also known as an electroretinogram, is a test that measures the electrical reaction of light-sensitive cells in your eyes. Rods and cones are the names given to these cells. They are a retina component, which is located behind the eye. The

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Deep learning-based power prediction aware charge scheduling approach in cloud based electric vehicular network

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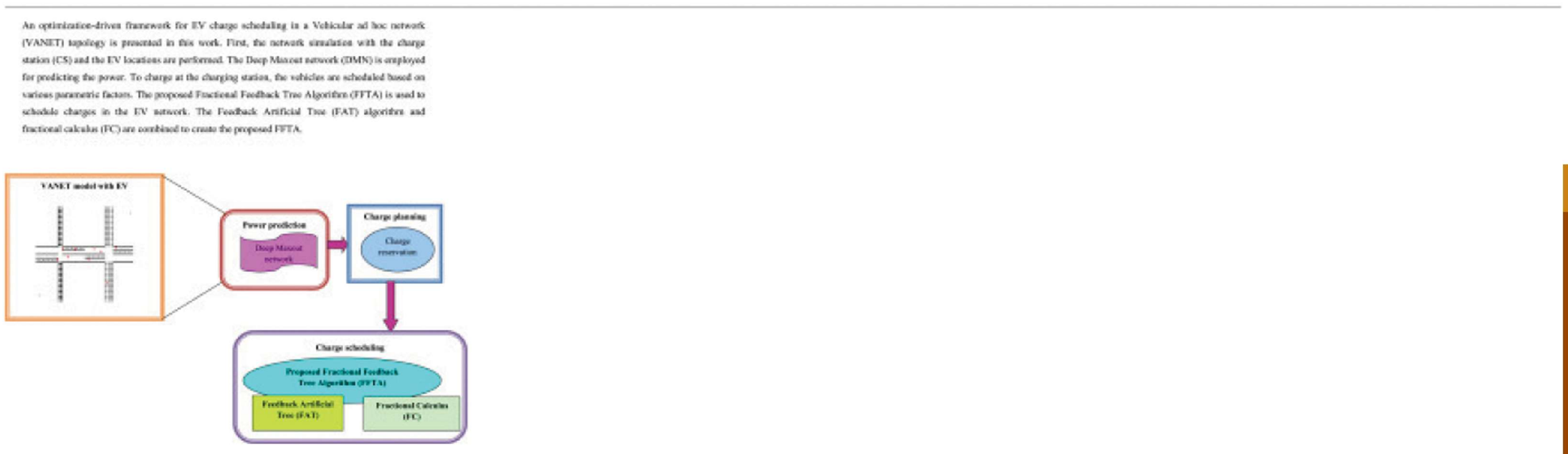
Abstract

Electric vehicles (EVs) are considered emerging popularity due to their cost-saving and eco-friendliness nature. The charging of EVs with elevated efficiency is a major issue for users as the hardware facilities, like charging stations are limited. Thus, the EV charging scheduling model is required to discover the charging schedule for each EV. An optimization-driven framework for EV charge scheduling in a Vehicular ad hoc network (VANET) topology is presented in this paper. First, the network simulation with the charge station (CS) and the EV locations are performed. The Deep Maxout network (DMN) is employed for predicting the power. To charge at the charging station, the vehicles are scheduled based on various parametric factors. The proposed Fractional Feedback Tree Algorithm (FFTA) is used to schedule charges in the EV network. The Feedback Artificial Tree (FAT) algorithm and fractional calculus (FC) are combined to create the proposed FFTA. Additionally, a new model of the fitness function is created taking into account variables like the average waiting time, the distance, the predicted power, and the quantity of EVs that are requested to be charged. With the shortest distance of 11.00 km, the highest power of 8.17J, the shortest average waiting time of 0.47 s, and less number of EVs charged at 4.4, the proposed FFTA offered improved performance.

Graphical abstract



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REVIEW

Review on Machine Learning Techniques for Medical Data Classification and Disease Diagnosis

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Abstract

Purpose Machine learning (ML) has become a major trend in the industry because it is a new and extremely advanced technical application.

Design ML is utilized in various areas including medicine, finance, and defense. Nowadays, a vast amount of data is readily accessible. As a result, analyzing this data to obtain any valuable information is critical. Machine learning algorithms have been applied recently to find trends in medical data and have proven to be extremely accurate predictors.

Findings ML techniques make correct predictions based on the past experiences. Therefore, it is a great approach which aids in the disease prediction and diagnosis. With the advancement of technology, the medical sector has benefited greatly from the convergence of ML and wearable technology in order to provide seamless solutions that are extremely accurate, efficient, and durable. In this review, medical data classification is analyzed with decision support system, medical image analysis, regularization techniques, and CBFL. By analyzing various approaches, better approaches in terms of accuracy were obtained for feature extraction, classification, and disease diagnosis process. This benefits patients by allowing for early detection and lower medical expenditures, as well as providing the medical community with efficient, scalable, accurate, and trustworthy prediction tools.

Originality In this paper, we look at some of the machine learning algorithms that have been used to establish successful decision support for healthcare applications and disease diagnosis. This review also discussed the classification of medical data, feature selection of medical data, decision support system, medical image analysis, etc.

Lay Summary In recent years, machine learning (ML) has the major impact due to its progressive technical applications. The techniques of machine learning provide accurate prediction based on past experiences. There are numerous ML approaches that have been developed and applied for disease classification and diagnosis. Analysing ML-based techniques provides valuable information to resolve critical research issues. In this review, various ML approaches are analyzed with respect to medical data classification and disease diagnosis. In addition to that, decision support system, medical image analysis, regularization techniques, and CBFL are analyzed. It directs to select efficient ML technique for accurate classification of medical data or disease diagnosis. In future work, public image dataset with various imaging modalities will be considered for the classification task and the given information will be analyzed in various aspects. The computer-aided diagnosis of different image modalities with hybrid ML architecture from medical data will be investigated for early disease classification and diagnosis.

Keywords Machine learning · Medical sector · Feature selection · Healthcare

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Introduction

Medical imaging is indeed the fast growing area of research used to make an accurate diagnosis of disease for early treatment. The role of image analysis in the healthcare sector is related to the rising posture of medical imaging. Machine learning (ML) algorithms are crucial in training a computer

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Violation of Traffic Rules and Detection of Sign Boards

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Abstract— Today's society has seen a sharp rise in the number of accidents caused by drivers failing to pay attention to traffic signals and regulations. Road accidents are increasing daily as the number of automobiles rises. By using synthesis data for training, which are produced from photos of road traffic signs, we are able to overcome the challenges of traffic sign identification and decrease violations of traffic laws by identifying triple-riding, no-helmet, and accidents, which vary for different nations and locations. This technique is used to create a database of synthetic images that may be used in conjunction with a convolution neural network (CNN) to identify traffic signs, triple riding, no helmet use, and accidents in a variety of view lighting situations. As a result, there will be fewer accidents, and the vehicle operator will be able to concentrate more on continuing to drive but instead of checking each individual road sign. Also, simplifies the process to recognize triple driving, accidents, but also incidents when a helmet was not used.

Keywords- Helmet detection, traffic sign board detection, accident detection, triple riding detection, object detection

I. INTRODUCTION

Accordance to a study by the World Health Organization titled "The Global status Updated Manuscripts Received on December 5, 2019 statement on road safety 2018," 50 million people worldwide suffer injuries and Every year, 1.35 million individuals perish from road accidents. It is almost difficult to conceive that walkers, bikers, and motorcyclists all bear an equal share of this load. This research said that in order to preserve lives, a thorough plan of action must be put in place. In practically every nation, two-wheelers are a highly common means of transportation. Yet, because there is less protection, there is a considerable danger associated. The rider of a two-wheeler gets flung from the vehicle in the event of an accident because of a quick deceleration. The velocity of the head stops when it collides with an item, but the motion of the brain is maintained by the mass of the brain until the object strikes the interior region of the skull. This kind of brain injury may occasionally prove deadly.

Helmets save lives in these situations. Helmets decrease the likelihood that the skull will slow down, which lowers head motion to nearly nothing. When time passes, the helmet comes to a stop after the helmet's cushion has absorbed the impact of the accident. Moreover, it disperses the force of the hit across a wider region, protecting the skull from serious wounds. Most significantly, it serves as a mechanical shield between the rider's head and whatever it is they come into touch with.

If a complete helmet of excellent quality is worn, injuries can be reduced. The purpose of traffic regulations is to instill a feeling of discipline so that the danger of fatalities and serious injuries can be greatly reduced. Nevertheless, these laws are not strictly followed. Thus, effective and practical methods must be developed to solve these issues. To reduce the risk connected with riding a motorcycle, it is universally advised that motorcyclists wear helmets. The fact that India ranks first when it comes to fatalities from traffic accidents is concerning. The expert study suggests that this increase may be caused by rapid

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Recommendation of Algorithm for Efficient Retrieval of Songs from Musical Dataset

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Abstract—Now-a-days, the research is more towards the entertainment like music, songs, movies, etc. There are many existing works that suggest good songs, movies to people depending on their mood, nature and time that has been savior for the society during the days of lockdown. The existing algorithms used in the literature for basic clustering are K-means, TSNE (T- distributed Stochastic Neighborhood Embedding), PCA (Principal Component Analysis).In this paper, the music dataset considered, consists of songs with attributes as song name, genres, artists, mode, tempo, valence, year, liveness, loudness, popularity, acousticness, danceability, duration, energy, explicit, instrumentalness, key. The important feature is extracted from the other features with the support of literature survey i.e., number of music listeners, types of the songs and type of the music. Later, the dataset is divided into clusters using traditional technique that is k-means based on genre, an important attribute which is selected from the above attributes. The different classifier models like Random Forest, Extra Trees, LightGBM, XGBoost, CatBoost classifier are applied on the clustered dataset and the results have been evaluated on each individual algorithm. Thus the paper recommends not only the group of relevant songs but also suggests the best accurate classification algorithm that can be used for any mentioned musical dataset. The paper also compares all the said ensemble algorithms by calculating the precision, recall, f1-score and support. The accuracy is also calculated for all said ensemble algorithms and based on the accuracy the best suitable algorithm is suggested.

Keywords-Musical dataset; Ensemble learning; Random Forest; Extra trees; LightGBM; XGBoost; CatBoost.

I. INTRODUCTION

All Musical datasets have become increasingly important in today's world, where music is a ubiquitous part of daily life. A musical dataset is a collection of metadata such as song titles, artists, genres, and other attributes that describe the music. Musical datasets provide a rich source of information, enabling them to better understand the characteristics of different songs and genres and make more accurate recommendations.

Musical datasets are also important for music genre classification, where they are used to train machine learning models to recognize the characteristics of different genres based on their audio features such as tempo, rhythm, and melody. Musical datasets are also useful in music emotion recognition, where machine learning models are used to predict the emotional response of listeners to different musical pieces.

Machine Learning is a subset of Artificial Intelligence which uses various algorithms for making predictions, allowing the machine learning model to automatically learn from training data, and predicts the outcome of new data based on historical data.

The machine learning techniques are classified into supervised, unsupervised, semi supervised and reinforcement learning which are used in regression, classification models and clustering methods.

Regression is used to predict continuous values like Salary, Age. The process of categorizing the data (which is a

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