Department of CSE [Artificial Intelligence & Machine Learning]

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Deep Learning Based Cancer Detection in Bone Marrow using Histopathological Images

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Abstract*—The cancerous proliferation of abnormal white blood cells (WBC) in the bone marrow and blood is characteristic of leukemia, which has its origins in these blood-forming tissues. Blasts are immature aberrant cells that inhibit the creation of new, lineage-normal blood cells. Acute Lymphoblastic Leukemia (ALL), Acute Myeloid Leukemia (AML), Chronic Lymphocytic Leukemia (CLL), and Chronic Myelomonocytic Leukemia (CML) are the four Chronic Lymphocytic Leukemia (CLL), Chronic myeloid leukemia (CML), and Acute myeloid leukemia (AML) (CML). Patients with leukemia are often diagnosed after their symptoms have been evaluated, a complete blood count (CBC) has been run, and a peripheral blood smear has been examined under a microscope by a pathologist. As part of the process to confirm and classify leukemia, a bone marrow examination and other sophisticated laboratory testing are performed. Traditional blood and bone marrow smear examination using light microscopy is plagued by intra- and inter-observer variability. Overcoming these individual biases of doctors is possible with the use of image processing-based approaches that can automatically analyse pictures of blood and bone marrow smears to detect abnormal cells. Using an American Society of Hematology dataset, the researchers classified cases of ALL into B-cell and T-cell subtypes, as defined by the World Health Organization (ASH). The research improves classification accuracy to 94.12% and compares the effectiveness of three distinct training strategies. The research also includes subtyping AML into M3, M4, and M5 using a ResNet-50 pretrained network and traditional machine learning based classifiers based on the CNN's characteristics. Using the features of ResNet-50, we were able to get a classification accuracy of 96.43 percent, and we were able to get a hundred percent accuracy using just a small number of traditional classifiers. Using the properties of Element and an ASH dataset, the researchers also sought to classify cases of chronic leukemia into CLL and CML. Classification using the Element yields an accuracy of 92.59%, while classification using the SVM with the Lucent's deep features yields an accuracy of 98.15%. The study's classifications are based on a straightforward framework that doesn't need sophisticated picture segmentation or feature extraction. The research has various limitations, one of which is that the dataset utilized in some of the classifications is not particularly big, which leads to a loss in classification accuracy. To address this, the research used data augmentation methods.

Keywords*—cnn algorithm, plane extraction, linear distinction stretching, world thresholding, gray level co-occurrence matrix, sickle cell anemia.

I. INTRODUCTION

Cancer is the name given to a group of diseases that are life-threatening and are characterized by the development of abnormal cells that divide rapidly and uncontrollably [1] and spread to other tissue and organs of the body [2]. Cancer is the name given to the disease that is associated with the development of these abnormal cells. According to the Mayo Clinic in Rochester, cancer ranks as the world's second greatest cause of death [3]. The top place goes to cardiovascular disorders (CVD). There are more than 200 distinct forms of cancer (Cancer Research UK, 2020). The following are some of the primary clinical terminology that are used to depict the many forms of cancers:

A. Carcinoma

It is the most prevalent kind of cancer and is produced by epithelial cells, which are the cells that line the interior and exterior surfaces of many organs throughout the body [4].

Sarcoma is a kind of tumor that develops in connective tissues [5]. These connective tissues include bone, cartilage, muscle, fat, blood arteries, and lymph vessels, among other things.

According to the National Cancer Institute in the United States of America [6]. leukemia is a non-tumor type of cancer that begins in the blood-forming tissues of the bone marrow and results in a large number of abnormal white blood cells in the blood and bone marrow, which crowds out normal blood cells.

B. Lymphoma

Lymphoma is a kind of blood cancer that originates in the disease-fighting cells known as lymphocytes [7]. Lymphomas are characterized by the accumulation of aberrant lymphocytes in the lymph nodes and other organs throughout the body.

C. Myeloma

It is a kind of blood cancer that originates from the plasma cells, and another name for it is multiple myeloma [8]

According to the World Health Organization's 2020 report, low- and middle-income nations account for around 70% of all cancer fatalities. A high body mass index, a poor intake of vegetables and fruits, a low level of physical

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Human Action Recognition by Learning Spatio-Temporal Features with Deep Neural Networks

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Abstract

Human action recognition plays a crucial role in various applications, including video surveillance, human-computer interaction, and activity analysis. This paper presents a study on human action recognition by leveraging CNN-LSTM architecture with an attention model. The proposed approach aims to capture both spatial and temporal information from videos in order to recognize human actions. We utilize the UCF-101 and UCF-50 datasets, which are widely used benchmark datasets for action recognition. The UCF-101 dataset consists of 101 action classes, while the UCF-50 dataset comprises 50 action classes, both encompassing diverse human activities. Our CNN-LSTM model integrates a CNN as the feature extractor to capture spatial information from video frames. Subsequently, the extracted features are fed into an LSTM network to capture temporal dependencies and sequence information. To enhance the discriminative power of the model, an attention model is incorporated to improve the activation patterns and highlight relevant features. Furthermore, the study provides insights into the importance of leveraging both spatial and temporal information for accurate action recognition. The findings highlight the efficacy of the CNN-LSTM architecture with an attention model in capturing meaningful patterns in video sequences and improving action recognition accuracy. You should leave 8 mm of space above the abstract and 10 mm after the abstract. The heading Abstract should be typed in bold 9-point Arial. The body of the abstract should be typed in

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Predicting the Spread of the Corona Virus Disease Requires Analyzing Data from Cases across Multiple States in India

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Abstract. Data analysis is very sophisticated tool in recent corona virus pandemic to find the trend of spreading pattern for controlling the infection. In this perspective, predictive analytics can be useful for data analysis to forecast the corona virus pandemic. This paper presents the infection pattern of corona virus disease, termed as COVID-19 in top seven states in India. Prophet Algorithm forecasting model was used to analyze state-wise spreading pattern of corona virus disease with respect to confirmed, deaths and cured cases. This predictive model can be very helpful to government and health care communities to combat this deadly virus by initiating suitable actions to control its spread.

Keyword: COVID-19, Predictive analytics, Forecasting model, Prophet Algorithm.

1 INTRODUCTION

The world is experiencing a significant challenge due to the pandemic outbreak of corona virus disease causing global health crisis. The corona virus is termed as COVID-19 by the World Health Organization (WHO).This pandemic infection is caused by the extreme critical respiratory disorder corona virus 2 (SARS-CoV-2) [1]. WHO had confirmed COVID-19 as pandemic worldwide on March 11, 2020 [2]. Corona viruses generally target the upper and lower parts of human respiratory systems, causing a range of illness symptoms such as fever, tiredness, dry cough, fatigue, headache, nasal congestion, loss of taste and smell, difficulty in breathing, muscle and joint pains, sore throat, sputum

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Techniques of Machine Learning for the Purpose of Predicting Diabetes Risk in PIMA Indians

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Abstract. Chronic Metabolic Syndrome Diabetes is often called a "silent killer" due to how little symptoms appear early on. High blood sugar occurs in people with diabetes because their bodies have a hard time maintaining normal glucose levels. Care for a recurrent sickness would be permanent. The two most common forms of diabetes are type 1 and type 2. A better prognosis can help reduce the high risk of developing diabetes. In order to better predict the likelihood that a PIMA Indian may develop diabetes, this study will use a machine learning-based algorithm. The demographic and health records of 768 PIMA Indians were used in the analysis. Standardisation, feature selection, missing value filling, and outlier rejection were all parts of the data preparation process. Machine learning techniques such as logistic regression, decision trees, random forests, the KNN model, the AdaBoost classifier, the Naive Bayes model, and the XGBoost model were used in the study. Accuracy, precision, recall, and F1 score were the only metrics utilised to assess the models' efficacy. The results demonstrate that. The results of this study reveal that diabetes risk may be reliably predicted using machine learning-based models, which has important implications for the early detection and prevention of this illness among PIMA Indians.

Keyword: Pima Indians, Diabetes, Machine Learning, Data Pre-processing, Feature Selection, Normalization, Early Diagnosis, Prevention.

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Classification of Potholes and Plain Roads For Self-Driving Cars

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Abstract:
Autonomous vehicles are crucial in applying traffic intelligence. The safety of self-driving automobiles is thus impacted by the smoothness of the road. Road potholes may cause a variety of problems, including auto damage and the likelihood of crashes. So, real-time pothole identification on the road should allow self-driving cars to adjust their behavior. This issue is dealt with using a variety of techniques, such as 3D laser aging and using vibration-based sensors. These techniques were, however, constrained by factors like high costs and the danger of being discovered. Therefore, it is vital to quickly and accurately automate the process of identifying potholes. In this paper, we have implemented transfer learning and CNN-based solutions to solve image classification problems using data from potholes and plain road images. The Kaggle dataset is used in this work. The goal of the work is to build models that identify if the image has potholes or is a plain road without potholes. Accordingly, it is a binary classification problem. The convolutional neural network deep learning model is stored and used for the prediction of potholes and plain roads which resulted in a final accuracy of 97.14%.

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Employability Prediction using Facebook Prophet for Computer Science and Engineering Graduates

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Abstract— **Student career prospects are critical for colleges and universities since it is frequently used as a criterion of success. Interestingly, the employment market scenario is changing faster than ever as a result of globalization, digitization, and recent developments in Artificial Intelligence (AI). Understanding the key factors affecting employability as well as the requirements of the new job market may be helpful to all educational institutions. Educational institutions all across the globe are eager to create, design, and make adjustments in the Computer Science and Engineering (CSE) curriculum that will help their graduates succeed in employment opportunities. Time-series analysis is a popular tool for predicting the future by analyzing previous data. In educational institutions, fact-driven and Machine Learning (ML) methodologies are frequently used. More and more research is looking at ML approaches for predicting employment prospects. This research explores the employability of CSE students in campus placement using a time-series method. Facebook Prophet (FBP) was used in this study to estimate the employability of Computer Science and Engineering (CSE) students in campus placement by taking into account two global parameters: over-hiring and recession. Facebook Prophet with global factors consideration was analyzed and evaluated in terms of accuracy. The FBP model with global factors consideration has yielded an accuracy of 93.6%. This study came to the additional conclusion that significant global issues, including the recession and overhiring during the pandemic, affected the placement status of CSE students.**

Keywords—Academic Performance, Excess Hiring, Employability, Job market, Pandemic, Recession, Under Graduate Student.

I. INTRODUCTION

ML and Deep Learning techniques are widely employed to detect security vulnerabilities in Internet of Things (IoT) Devices [1], Wireless Sensor Networks (WSNs), predict diseases in humans [2], predict the academic performance of a student in the higher education system, predict employability of student in educational institutions, predict suicides in organizations, etc. The Employability Prediction Model (EPM) is the system that can predict whether any student in university or college becomes employed or remains unemployed in campus placements. The employability of any undergraduate student depends on static factors like cognitive skills, programming skills, exposure to cutting-edge technologies, certification courses, internships, aptitude skills, reasoning skills, logical skills, soft skills, problem-solving skills, and analytical skills of the student. Employability of any undergraduate student also depends on non-static parameters and global economic factors like market demand, job openings, country's economy, certification courses on latest technologies, internships on latest technologies, curriculum adjustment, excess hiring, knowledge and exposure to latest technologies, etc. The employability of CSE students depends on traditional and static parameters like academic performance, cognitive skills, programming skills, aptitude skills, reasoning skills, logical skills, soft skills, problem-solving skills, and analytical skills. The employability of CSE students depends on many non-static factors like automation, over-hiring, recession, job openings, and market demand. For example, if market demand is high, the chance of getting hired in campus placement is high for an average student. If the market demand is dull due to recession and macroeconomic conditions, the chance of getting hired in campus placement is low even for a brilliant student. Similarly, if the number of job seekers is larger than the number of openings the chance of getting hired in campus placement is low for an average student. Likewise, if a CSE student who had good academic performance doesn't have exposure to the latest technologies then the chance of getting hired is less. Firstly, excessive hiring during the COVID-19 pandemic had a critical impact on campus placements in 2023 and it is continuing. Secondly, factors like the Russia and Ukraine war have also led to a slowdown in hiring in campus

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Segment Anything: GPT-3 and Logistic Regression Approach for Skin Cancer Detection

3

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Abstract: The ability to identify and categorize computer vision analysis high dimensional data is crucial for machine learning. Many Skin Cancer Diagnosis Disease Detection Systems based on artificial intelligence (AI) in Computer Vision Model use the categorization of illnesses into benign and malignant groups, including the classification of skin cancer. Among the several categorization methods, logistic regression stands out for its clarity, efficiency, and interpretability. This paper will cover the theories underlying cancer diagnosis and illness recognition, the Hybrid model of Skin Cancer Detection operation of Segment Anything: The GPT-3 of Computer Vision and logistic regression, as well as their potential Deep Learning application to the classification complex associated with skin cancer.

Keywords: Computer vision, Logistic regression, Skin cancer, Segment anything, The GPT-3

1. Introduction

Computer vision is a branch of AI that allows computers to interpret and analyze visual input. A method mimics the way humans take in and make sense of their environment. It uses ML (machine learning) models to identify and label objects in digital imagery. Because of this, computers can now act on the information they find. Segmenting an image, identifying an object or a face, recognizing a pattern or an edge, classifying an image based on one or more features, and matching features are all examples of computer vision techniques [1]. Using computer vision paves the way for a plethora of new possibilities in the realm of technology. It has enabled self-driving cars to go safely on highways and roads, facial recognition software to identify persons in photos, and augmented reality software to superimpose virtual objects onto actual photographs [2]. Computer vision applications are used in many fields to boost safety, cut costs, and satisfy customers. It aids production facilities in preventing defective products from reaching consumers by identifying them early on in the manufacturing process. It makes it easier for insurance adjusters to assess vehicle damage and minimizes fraud at every stage of the claims process. X-rays, MRIs, and ultrasounds are all tools used by doctors to diagnose illness.

One of the costliest medical problems in the world is now thought to be related to cancer. Unrepaired DNA damage produces mutations, and skin cancer occurs when abnormal cells grow uncontrollably within the epidermis, the outermost layer of skin. Due to these alterations, skin cells multiply rapidly and tumors form. Merkel cell carcinoma (MCC), basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and melanoma are the four most common forms of skin cancer. Due to individual differences in skin tone, size, kind, and location on the body [3, 4, and 5], the appearance of skin cancers can vary greatly from person to person. Sunlight

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2023-24

Early-Stage Chronic Kidney Disease Detection using Machine Learning with Bigdata

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Abstract: Chronic kidney disease (CKD) is a major cause of death and disability across the world, as well as a major drain on healthcare resources. Despite the need for early diagnosis and treatment to prevent further development, many people are identified late in the disease's course. Detection, risk stratification, and prognosis prediction for CKD have all seen significant changes with the introduction of Big Data analytics and Machine Learning (ML). This paper summarizes the most up-to-date findings and implementations of ML approaches in conjunction with Big Data for detecting CKD in its earliest stages. To determine whether ML techniques (such as Random Forests, Support Vector Machines, and Deep Learning) are effective in CKD prediction, we conducted a systematic review of the relevant literature published over the past decade. The prediction accuracy of early CKD stages has also been improved by the integration of electronic health records, genomics, and other omics data, which has resulted in rich, high-dimensional datasets. We examine methods used to deal with difficulties including missing data, over-fitting, and heterogeneity in the data. We also discuss the moral and safety issues that come up while handling patient information. Early CKD diagnosis is ripe for a revolution, and this paper highlights the intriguing potential of ML and Big Data to bring that about. Better patient outcomes may be achieved via the ethical and efficient use of new technologies.

Keywords: Early stage; Chronic kidney disease; Detection, Machine learning; Big data

1. Introduction

One of the biggest health issues in the world, chronic kidney disease (CKD) affects millions of people and costs healthcare systems a lot of money. The tragedy of CKD is its quiet course; many don't get identified until the condition has progressed to the point when there are few effective treatments left and consequences are at their worst. Early CKD identification is thus crucial for improving patient outcomes and reducing the socioeconomic costs associated with late-stage treatments [1]. There is now a multitude of patient data available thanks to the explosion of big data in the healthcare industry, including laboratory test results, imaging, electronic health records, and patient-generated inputs. When properly used, such data may play a critical role in identifying illness trends and projecting future health trajectories. However, because to the data's intrinsic complexity, advanced analytical approaches that can recognize complicated linkages and patterns are required [2].

Using automated pattern recognition and prediction based on such patterns, machine learning, a type of artificial intelligence, excels in making sense of massive datasets. With regard to CKD, ML models may be trained on big datasets to forecast the chance that a patient would get the condition, even before the disease's conventional clinical signs appear.

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Data-driven Identification of High-risk Patients for CKD-Machine Learning Perspective

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***Abstract*— One of the most common illnesses that affect people on a broad scale is chronic kidney disease, or CKD, which is lethal since it does not manifest itself until a person's kidneys have sustained irreparable damage. The progression of CKD is linked to several serious side effects, such as an increased risk of different illnesses, anemia, hyperlipidemia, nerve damage, problems during pregnancy, and even total kidney failure. This illness claims the lives of millions of individuals each year. As no significant symptoms can be used as a baseline to diagnose the condition, diagnosing CKD is challenging. We have developed a machine-learning strategy to determine whether a patient has CKD. The application of machine learning techniques to CKD prediction has the potential to improve patient outcomes by facilitating earlier disease detection and more effective management of the condition. The logistic regression model and Random forest demonstrated the best performance and interpretability, making them useful tools for clinical practice. These findings need to be confirmed by additional studies in order to enhance how accurately machine learning systems predict CKD.**

Keywords—Logistic Regression, Chronic kidney disease, Support Vector Machine, Random Forest, k-nearest neighbor, and feed-forward neural network.

I. INTRODUCTION

In China, 10.8% of people have CKD. whereas it varies from 10% and 15% in the US. Another survey indicates that the overall adult population of Mexico has this percentage at 14.7%. This condition is characterized by a progressive decrease of renal capacity, which happens at the end of the disease. CKD does not at [1] first show any signs. Till the kidney has given up roughly 25% of its operation, the condition may not be observed. Additionally, CKD has a high prevalence of morbidity and death and affects the human body globally. An incurable pathologic illness, CKD gets worse over time. It is essential to recognize and address [2] CKD as soon as it presents itself. This technology enables accurate and affordable illness diagnosis, making it a potentially useful method for diagnosis. Information technology has developed into a new medical [3]tool with numerous potential uses as a result of its growth. Deep learning has previously being used in the medical field to diagnose a variety of diseases, look at important disease-related issues, and regulate the state of human body. For instance, the classifiers were utilized to diagnose acute renal injury, cancer, heart disease, diabetes, and retinopathy.

Using deep learning algorithms (DLAs) from artificial intelligence (AI) to imaging data has demonstrated superior performance to manual image interpretation in the [4] diagnosis of illnesses including skin cancer and diabetic retinopathy. DLAs used in renal ultrasonography could find chronic kidney disease as well. By using DL models to predict early CKD, it is possible to stop the progression of ESRD and thus save costs. For categorizing chronic diseases like liver disease, heart disease, and renal disease, the researchers achieved very strong results using DL models. Furthermore, the use of DL algorithms contributes to the creation of a quick-acting, non-invasive [5], and readily navigable platform that is made up of different kidney disease-related data. A valuable supporting tool for the early, precise, and quick diagnosis of CKD will eventually be produced.

II. LITERATURE SURVEY

A Novel Multi-Focus Fusion Analysis Technique for Adaptive and Gradient Joint Constraints GAN

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Abstract

Image fusion aims to combine information from various images form a single image that, in theory, incorporates all the essential elements from each of the initial images. The imaging system's limited extent of the field makes it challenging to retrieve all the useful information from a single image. Multi Focus Fusion (MFF-GAN), a generative adversarial network, is used in digital photography to merge images with very distinct focal points in order to reduce the Defocus Spread Effect (DSE) by creating focus maps where the foreground is appropriately greater than the related items. According to the differentiation of repeating blur, this framework introduces a flexible selection phase to determine if original cells concentrate or not. By retrieving and recreating information, our technology enables multi-focus picture fusion, which almost eliminates blurring and feature damage at the boundary. The present approaches that make use of precise concentrated pictures are known as deep learning techniques. Several programs, including Multi Focus Image Fusion, use deep learning.

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Intrusion Detection System in IoT using Grey Wolf Optimization-Based Support Vector Machine

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***Abstract*—The Internet of Things (IoT) is appearing as a new technology for the development of different critical applications. To prevent adversarial attacks, fraud, and network intrusion, the Intrusion Detection System (IDS) has become a major component of organizations. In this research, the Grey Wolf Optimization based Support Vector Machine (GWO-SVM) is proposed for the intrusion detection system using machine learning. Initially, the data is obtained by the Bot-IoT dataset and then min-max normalization is performed to normalize the acquired data. The different feature extraction approaches such as LeeNET, Gray-Level Co-occurrence matrix (GLCM), and Local Ternary Pattern (LTP) are used to extract appropriate features from the obtained data. The GWO approach is used for feature selection which examines appropriate features for classification. Finally, the SVM classification is performed to identify and classify intrusion detection accurately and effectively. The proposed GWO-SVM achieves a better accuracy of 99.67%, precision of 99.50%, recall of 99.47%, and f1-score of 99.60% respectively.**

***Keywords*—Internet of Things, Grey Wolf Optimization, Machine Learning, Network Intrusion System, Support Vector Machine.**

I. Introduction

The Internet of Things (IoT) is a smart network that connects things to the Internet with the goal of exchanging data through established protocols [1]. A key component in providing the security of IoT networks is the detection of intrusions. An Intrusion Detection System (IDS) secures networks by continuously monitoring traffic and detecting malicious activity at Internet gateways [2]. It is designed to maintain the three information system security principles of integrity, confidentiality, and availability and is created to offer strong cyber security protection in operating infrastructures [3]. Many IDS have been developed for secure internet communication. It actively monitors the network for malicious activity and alerts the system administrator when it is found. IoT devices are small and portable, which makes them perfect for remote regions [4]. The intrusion detection method is classified into two groups: blacklist-based methods and knowledge discovery-based methods. The blacklist-based method monitors traffic networks and stores malicious traffic patterns in databases. Regular updates are necessary, but these methods are ineffective. Knowledge discovery-based methods can automatically detect hidden patterns and network malfunctions [5]. Security vulnerabilities in the protocols used in IoT systems affect the entire system [6]. There have been numerous efforts made to improve IoT security, including the adoption of difficult access control mechanisms for data confidentiality, the application of encryption on data transported in networks, and various privacy and trust rules among users and IoT devices [7]. Optimizing the performance of IDS includes decreasing the number of features in the data collection without sacrificing the accuracy of classification [8].

The main contribution of this research is as follows:

- The data is obtained by the Bot-IoT dataset to evaluate the performance of the GWO-SVM approach and then min-max normalization is performed to normalize the acquired data.
- The different feature extraction approaches such as LeeNET, GLCM, and LTP are used to extract appropriate features from the obtained data. The GWO approach is used for feature selection which examines appropriate features for classification.
- The SVM classification is performed to identify and classify intrusion detection accurately and effectively.

The remaining paper is illustrated as follows: Section 2 describes the literature survey. The block diagram of the proposed method is discussed in Section 3. The results are illustrated in Section 4. Section 5 discussed the conclusion of this paper.

II. Literature Survey

The related works about IDS in IoT were given in this section along with its advantages and limitations.

Devansh Srivastav & Prakash Srivastava [9] implemented an ensemble learning approach to detect the behavior of intrusion detection in IoT networks. The implemented ML employs voting among an XGBoost and Random Forest (RF) classifier which combines the boosting and bagging approach to classify normal or anomalous. The NIDS was highly efficient by utilizing an ensemble approach that detects intricate patterns effectively for real-time detection. However, the ensemble approach leads to enhanced computational complexity which limits the scalability in resource-constrained IoT scenarios.

R. Anushiya & V.S. Lavanya [10] presented a Genetic-Algorithm-Faster Recurrent Convolutional Neural Network

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Multi-Class Sentiment Classification using Feature Selection and Machine Learning Algorithms

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***Abstract*—Sentiment analysis (SA) is a popular method for collecting relevant and arbitrary information from text-based data. To locate, examine, extract reactions, and emotions from the data or states, it applies computational linguistics, biometrics, text analysis, and Natural Language Processing (NLP). A SA model can be developed and improved with the use of the features analysis method. However, it can be difficult to find best classification methods for this type of data. When compared to current feature-based methods, machine learning approaches for analysis of sentiment, are capable of providing precise representation and improved performance. In this paper, the machine learning (ML) method was proposed for improving sentiment classification performance with a sophisticated embedding word method and develop an Emperor Penguin Optimization (EPO) and Multi-class Support Vector Machine (SVM). For the purpose of predicting the sentiment of tweets for classification, a large amount of Amazon data is analysed. This study, concentrate on improving sentiment analysis performance by building a Multi-class SVM network and particularized model of machine learning with novel word embedding techniques. The Multi-class SVM model has achieved 99.89% accuracy sentiment analysis.**

Keywords*—Machine Learning, Emperor Penguin Optimization, Support Vector Machine, Sentiment analysis and Word embedding.

I. Introduction

The process of locating, extracting, and categorising subjective information from unstructured text using text analysis and computational linguistic approaches is known as sentiment analysis (sometimes referred to as opinion mining) [1]. Sentiment analysis explores at the opinions, viewpoints, attitudes, sentiments, and perceptions that individuals share on different social media sites [2,3]. This establishes if a clause, paragraph, or sentence expresses the text's polarity or positive or negative opinion [4]. By use of textual assessments or reviews on social media (such as forms, social networking sites, blogs, etc.), it looks at people's feelings on a variety of subjects, including people, issues, events, people, and objects [5]. Amazon is one well-known retailer that permits customers to freely evaluate and discuss products. Evaluating these evaluations and categorising them as good or negative can help customers make decisions about investing, buying a phone, cameras, or other product, or writing movie reviews. The customers' daily lives will be significantly impacted by each of these behaviours. Sentiment analysis can be using a variety of data mining techniques, many of which are always attempting to get more accurate. Intuition suggests that the previous studies only considered product and user data as separate attributes that might be added separately to the text representation [6]. Everyone may now communicate their thoughts and opinions online thanks to the social media industry's rapid expansion. In order to understand what customers or reviewers believe, sentiment analysis is crucial [7]. The study aims to create an efficient feature selection approach for sentiment analysis, similarly to this classified using Machine learning, a kind of AI. [8].

- The data is obtained by the Amazon review dataset and then tokenization is used for pre-processing the acquired data.
- The EPO approach is employed for feature selection which examines appropriate features.
- The MSVM classification is performed to identify and classify the sentiment accurately and effectively. The efficacy of EPO-MSVM is analysed by using performance measures of accuracy, precision, recall, and f1-score.

The remaining sections of this paper is structured as follows: the literature review is described in Section 2, and the implemented method is described in Section 3, the experimental result of the implemented method is described in Section 4, and the Conclusion of this paper is given in Section 5.

II. Literature Survey

Xiangsen Zhang *et al.* [9] implemented Sliced Bidirectional Gated Recurrent Unit (Sliced Bi-GRU) method utilized for classification of text sentiment. The implemented Sliced Bi-LSTM was combined with multi-head self-attention mechanism for learned hidden information from various subspaces. Datasets of Yelp 2015 and Amazon were used to evaluate the implemented method, and obtained better training speed for verified the model's effectiveness. However, this method based on BERT had performance loss so, this implemented method needs better classification method to overcome the performance loss.

Mohammed Qorich & Rajae El Ouazzani [10] implemented Convolutional Neural Network (CNN) method, which was utilized to classified text reviews' sentiments as positive or negative. The Amazon review dataset was employed to evaluated the implemented CNN method's performance. This method employed a random initialization

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Prairie Dog Optimization Based Efficient Task Scheduling in the Cloud Computing

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***Abstract*—In Cloud Computing CC, scheduling the algorithms depicts the significant role of identifying the possible tasks scheduling. An efficient task scheduling is considerable to achieve the cost-effective execution as well as enhance the resource utilization. The task scheduling problem is to classified as the Nondeterministic Polynomial (NP)-hard problem. To solve this issue, this research proposed an efficient meta-heuristic algorithm named Prairie Dog Optimization (PDO) to enhance the task scheduling behaviour in the cloud. The PDO is proposed to improve the task transmitting performance by the cloud network based on the workload of the cloud resources. The proposed method utilizes four prairie dog activities to attains the two basic optimization phases such as exploration and exploitation. The PDO utilizes the two strategies named burrow and foraging to attains the efficient and effective resource allocation. The PDO is modelled for scheduling and distributing the tasks are developed by utilizing the Virtual Machine (VM) factors, time as well as cost. The proposed PDO method attains better results and it achieves the makespan of 112.65, energy consumption of 90.47 and Degree of Imbalance (DoI) of 1.1 respectively when compared to the existing methods like Particle Swarm Optimization, Antlion Optimization (ALO) and Genetic Algorithm (GA).**

Keywords*—Cloud Computing, Nondeterministic Polynomial, Prairie Dog Optimization, Task Scheduling, Virtual Machine.

I. INTRODUCTION

Cloud Computing (CC) is the on-demand delivery of the computing services named storage, networks, servers, software, intelligence over the internet to provide quick development, adaptable resources as well as scale economics [1][2]. The cloud services are given on-demand through the Cloud Service Provider (CSPs) as well as administrated on the customers respective. For the purpose of utilizing the cloud, the customer requests the service with the group of CSP requirements. Furthermore, the customer basically needs the Virtual Machine (VM) occasions to develop their applications at the Datacentre (DC), which is designed by the CSP [3][4]. The efficient task scheduling approach is examined as the most difficult approach to overcome the energy utilization reduction challenge in cloud DC. The task scheduling approach tries to portrays the user-submitted tasks to particular VM with the objective of optimizing the cloud DC [5][6]. The task scheduling is the multi-objective optimization issue and it correspond to the Non-deterministic Polynomial (NP) hard problem. For task scheduling issue in CC, the approximation methods named metaheuristics algorithms can identify the optimal or solution nearest to the optimum in a minimum time [7][8]. These metaheuristics algorithms considered the performance metrices such as makespan, energy consumption, cost, resource utilization, Degree of Imbalance (DoI) and so on to evaluate the performance [9][10]. The major contributions of this research are as follows:

- This research effectively proposes the novel approach of PDO based task scheduling in the cloud environment.
- The proposed PDO algorithm performance is compared with the existing methods in terms of multi-objective functions.

The rest of the paper is organized as follows: Section 2 discusses the literature survey. Section 3 provides the proposed methodology. Section 4 discusses the experimental results and Section 5 provides the conclusion.

II. LITERATURE SURVEY

Laith Abualigah and Ali Diabat [11] implemented the hybrid Ant Lion Optimization (ALO) with Elite-based Differential Evolution (DE) for solved the problem multi-objective task scheduling in CC. The ALO was improved through utilized the Elite-based DE as the local search approach to enhance its exploitation capability as well as to eliminate the obtained trapped in local optima. The multi-objective according to Modified ALO (MALO) had minimized the makespan value as well as enhanced the resource utilization. However, the suggested approach may suffer imbalance among local and global search as well as exploitation search capability was not constant.

Sudheer Mangalampalli et al. [12] presented the Cat Swarm Optimization (CSO) for multi-objective task scheduling in CC. The suggested approach estimated the VMs at the level of VM and tasks superiority as well as randomly mapped the tasks onto the respective VMs. The migration time, makespan, energy consumption as well as total power cost at data centres were the performance metrices considered to evaluated the performance of the proposed method. However, the suggested approach had easily fell into local optimum as well as low convergence rate.

Seema A. Alsaidy et al. [13] introduced an enhanced initialization of Particle Swarm Optimization (PSO) by heuristic approaches for the task scheduling. The Longest Job to Fastest Processor (LJFP) as well as Minimum Completion

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Model stacking of Spatial Spectral Network with Capsule Networks for Classification of Hyper-Spectral Images

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***Abstract*—With the development of remote sensing technology, the application of Hyperspectral Images (HSI) is vastly utilized in various fields. In specific, the classification methods of HSI plays a major role in detecting the targets, environment management, mineral mapping and so on. The existing approaches based on classification of hyper spectral images faces problems related to poor classification results due to constrained receptive field and inability to acquire long range features. The spatial spectral network has the ability to perform pixel wise classification of HSI but training the model for large labeled datasets can be challenging and leads to overfitting issues. Caps Nets are designed to capture hierarchical relationships between features. In hyperspectral image classification, where complex spectral and spatial patterns may exist, Caps Nets can potentially model these hierarchical relationships in an effective manner and helps in effective classification. So, this research introduced the model stacking of SSN and Caps Net which enhance the overall performance of classifying the HSI with better accuracy. The data is acquisitioned from Indian pines and University of Pavia to estimate efficiency of proposed technique in classifying HIS. Experimental outcomes exhibits that the proposed approach achieved better results in overall metrics. The overall accuracy of proposed approach for Indian pines dataset is 97.82% which is comparably higher than the existing Weighted Feature Fusion of Convolutional Neural Network and Graph Attention Network (WFCG) with 90.86%.**

Keywords*—Capsule Networks, Hyperspectral Images, Model stacking and Spatial Spectral Network

I. Introduction

In recent times, data captured through hyperspectral sensors is become much accurate data with enhancing spatial and spectral resolutions because of advances in technology of spectral imaging [1-3]. The outcome of Hyper Spectral Image (HSI) has 2D spatial data and 1D spectral data about objects [4]. By their abundant data, HSI is utilized for different applications like precision agriculture, biomedical imaging, exploration of mineral, food safety and military reconnaissance [5-7]. Various data processing methods is explored for harness entire potential of HSI information like denoising, unmixing, target classification and detection. Between the above mentioned HSI processing methods, land cover data classification is attracted more attention [8]. Various traditional HSI classification techniques as developed like K-Nearest Neighbor, Bayesian Network, Logistic Regression and Support Vector Machine (SVM) [9]. Additionally, various techniques to reduce dimension and extraction spectral data has developed included Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA). Though these techniques ignored spatial correlation between pixels in spatial dimension and failed to fully utilize spatial features. The main contribution of research is as follows:

- In hyperspectral image classification, where complex spectral and spatial patterns may exist, Caps Nets can potentially model these hierarchical relationships in an effective manner and helps in effective classification.
- Stacking of SSN and Caps Net which enhance the overall performance of classifying the HSI with better accuracy.
- Performance of proposed approach is estimated with performance measure of Kappa Accuracy (KA), Overall Accuracy (OA) and Average Accuracy (AA) which performs efficient.

Rest of manuscript is organized as follows: Section 2 provides literature review. Section 3 provides details of proposed technique. Section 4 provides results and section 5 concludes the manuscript.

II. Literature Review

Pranshu Prakash Vaish et al. [10] implemented a Hybrid SN method to classify the hyperspectral images. The implemented method has single input layer, 3 layers of $3D$ conv blocks, single layer of $2D$ conv, 2 fully connected layer and single output layer. Given hyperspectral image has N spectral bands were minimized to B spectral bands utilizing PCA which was dimension reduction method. The implemented method effectively maximized test performance because of low training information and restricted count of training epochs. The implemented method has effective performance in hyperspectral image classification. However, the performance of classification was poor in case of less data samples.

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Modelling Soil Fertilizer Levels and Crop Yields : Agriculture Using Machine Learning

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***Abstract*—Technology is everywhere in the 21st Century. So, for optimum results in each field, various methods to minimize loss and maximize benefits. The application of Machine Learning in crop type prediction for modern farming is crucial. Also, suggesting the type of fertilizer and amount can increase the application's usability. Various aspects of rain amount and other real-world parameters are taken into account when predicting crop yields and suggesting fertilizer applications. To predict output, the application uses the Flask web framework to store a large number of datasets. The application then creates a link between Random Forest algorithms, Decision Tree algorithms, and XGBoost algorithms. This work focuses on crops that are significant in the area chosen. Based on soil fertility and weather data, the proposed model predicts crop type. The type of fertilizer to use for the chosen crop should be determined. Predict crop yields using a fertilizer calculator and estimate the economic impact of cultivation by calculating the amount of fertilizer needed.**

Keywords—Decision tree algorithm, XGboost Algorithm Random Forest algorithms, Flask web framework.

I. Introduction

The process of predicting crop yields involves estimating how much of a crop will be produced in a particular area. In addition to farmers and agricultural policymakers, businesses dependent on agricultural products can benefit from the tool. For centuries, researchers have been attempting to predict crop yields. Simple observations of weather patterns and crop growth were used to predict crop yields early on. Data on crop growth from space was collected using remote sensing technologies and stored and analyzed by computers. Statistical analysis, remote sensing, and machine learning are among the methods used in crop yield prediction today.

Planting, irrigation, and fertilizer are all based on yield prediction models. In addition to improving agricultural productivity, they are also used by agricultural policymakers. A long and complex history has been built up around crop yield prediction over the years. As a result of recent technological advances, models have become more sophisticated and precise as a result of the application of new technologies. As a result, agricultural policymakers, farmers and companies with a reliance on agricultural commodities now find it necessary to predict crop yields as part of their pre-production efforts.

This application which is often referred to as Crop Yield assistance application is designed to provide suggestio assistance to farmers in several different aspect agriculture. By providing farmers with crop yield predic and fertilizer recommendations, the system assists farm growing crops. A tool such as real-time predictions suggestions can greatly assist farmers in planning their in real-time and can have a positive effect on their livelil including their annual expenses and other aspects of thei

It is difficult for Indian farmers to make info decisions about what crop to grow without the assistan waterfalls every year. Farmers are committing suicide increasing rate every year. These cases are often exacer by untimely rainfall, drought, and heavy rainfall. After a struggle, farmers don't harvest their crops because of reasons. A scenario like this would force all farmers to their occupations and be replaced with alternative natives Indian economy relies heavily on agriculture an associated sectors. The agriculture industry employs people, directly or indirectly. There is a lot of fertilizer us soil due to the increasing population and food shortage. I end, soil quality may be degraded and soil contaminatior occur, leading to a variety of problems.

Statistical models are used to develop predictio machine learning, a branch of artificial intelligence. Pred models or advanced analytics may be used to describe traditional computing, machine learning is defined a ability of a computer to learn without explicit programi Analyzing data and generating outputs are part of ma learning algorithms. A training dataset is first used in approaches before algorithms are taught, predicted, improved as time goes on. AI is a branch of science that statistical models to make predictions. To describe i model may use predictive or advanced analytics. Tradit computing defines machine learning as a computer's abil learn without explicit programming. During machine lea algorithms, data is analyzed and outputs are gene Several approaches begin with a training dataset b teaching, predicting, and improving algorithms.

An important part of a country's economic developm its agricultural sector. The agricultural sector is one c most important sources of income for many people. espe in developing countries like India. The optimal yield c from knowing a variety of factors, including the crop environment, the soil content, and several other factors. model or system where farmers can get suggestio

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Predicting Chronic Kidney Disease using Machine Learning in the Early Stages

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***Abstract*—chronic kidney disease (CKD) is an illness that causes a decline in kidney function. The CKD early diagnosis is tough since it does not have initial symptoms. The early disease can stop the infection advancement with a well-timed diagnosis. The research aim is to implement and compare the various algorithm's performance and identify the best combinations that can provide better detection accuracy. We have found the solution using Machine Learning (ML) approaches that can achieve risk minimization. Seven ML algorithms have been utilized in this work with Accuracy, Precision, Recall, F1-Score, and Support as model evaluation parameters. In this comparison, RF and AdaBoost algorithms provided the uppermost accuracy worth 99%. Finally, data analysis is performed such as frequency distribution, Correlation between the features, Feature distribution plots, classification, and prediction plots. The domain of predictive analysis of CKD can be significantly enhanced by ML algorithms. By collaborating with them, healthcare professionals will be able to design a computer-aided diagnosis system that can enhance their ability to treat patients effectively.**

***Keywords*—Ada Boost, CKD, Logistic Regression, ML, Naïve Bayes, Random Forest**

I. Introduction

CKD is a disease that is rising every day in any age group and is considered a worldwide concern of irreversible disease. CKD is a painful situation for patients and it is non-symptomatic and non-observable at an early stage in kidney patients and becomes a huge problem once detected during diagnostic tests and leads to many critical situations. Most of the patients affected are due to High Blood Pressure, Hypertension, myocardial infarction, consumption of alcohol daily, Obesity, and other health issues [1]. According to the survey conducted by The World Health Organization (WHO), it is predicted that almost 500 Million patients across the globe are affected only by diabetes and numbers say, it will reach a peak of 642 million by the end of 2040.

Machine learning is a collection of computer programs that reduces computational cost and time. This technique is most useful in diagnosing CKD problems very accurately and efficiently. Machine learning algorithms are the most useful tool today and are used in many application areas of Medical Health records, sensing, analysis, and prediction of various diseases. To prepare data for machine learning models, data must be cleaned and normalized, and missing values must be handled. Treatment plans for CKD patients could be tailored using machine learning models based on their risk factors and characteristics. The use of machine learning in healthcare, including the management of kidney disease, is promising, but some challenges need to be addressed to ensure safety and effectiveness. These include data privacy, model interpretability, and regulatory compliance. To maintain their accuracy and reliability, models need to be continuously validated and improved.

Analyzing patient data can help detect CKD early with machine learning. In this way, healthcare providers can identify abnormal patterns and respond on time to them. Predictive models for CKD are developed using supervised machine learning algorithms. Various algorithms can be used to analyze data, such as logistic regression, random forests, etc. CKD status will be represented by a label on the data, like CKD or non-CKD.

The medical records are helpful information to the doctors, researchers, and physicians to predict the stages of CKD and also make decisions on the selection of therapy. Many researchers are working on clinical records to find the solution using machine learning approaches and other various methodologies such as data analysis, mining techniques; Correlation based approaches, feature selection, filtering techniques, Predictive Modelling, and classifications [2].

The paper is organized as follows Section I, Introduction; Section II, Describes the related survey; Section III, we propose methods for the task of CKD detection; Section IV, describes the experimental results, while our conclusion is presented in Section V.

Contributions:

The contributions of this work are as follows:

1. It has implemented a comparative analysis model for classifying CKD and non-CKD patients.
2. The model has tested seven ML models for better performance and results have proven that Random Forest and AdaBoost algorithms perform well in classification.

II. Related Work

Many authors contributed to the research on CKD on different aspects of Classification, Analysis, Diagnostics, treatments, and therapies. Here in this study, we have found that machine learning approaches are very informative in developing the models and CKD study. This model outperforms other available strategies when it comes to performance.

Linta Antony et al. [1] proposed an unsupervised framework for CKD prediction using five algorithms such as K-Means, Autoencoder, DBSCAN, and I Forest by integrating feature reduction methods and achieved a total truthfulness of 99% in classifying the medical statistics of the presence of disease or not. They also compared the proposed work with the previous in just to spotting the presence of the disease, but also in recognizing the illness stages. Davide Chicco et al. [2] provided a method to predict whether patients

A Novel Encryption Framework to Improve the Security of Medical Images

M. Senthilkumar, K. Suthendran, S. V. Suji Aparna, Mahesh Kotha, S. Kirubakaran, Srinivasarao Dharmireddi, and Voruganti Naresh Kumar

Abstract In medical imaging, image security is crucial yet difficult to implement. To protect medical images, numerous studies have been carried out. Image confidentiality may be achieved using encryption without the risk of data loss. Traditional encryption approaches cannot be used to protect e-health data directly because of restrictions on data size, redundancy, and capability, particularly when medical data are transported via unencrypted networks. Because images differ from text, they have a greater potential for loss of information and privacy; patients may no longer be able to access their data. Researchers have recognized these security risks and have suggested several image encryption approaches to address the issue. However, the researchers discovered that the proposed solutions still have several application-specific security issues. To provide an effective image encryption method for the healthcare sector, this study offers a novel cuttlefish particle swarm-optimized ciphertext-policy weighted attribute (CPSOCPWA) algorithm. The security and computation time of the suggested method is examined, assessed, and then contrasted with those of typically encrypted methods. It has been determined how well the

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Kullback–Leibler Divergence-Based Feature Selection Method for Image Texture Classification

M. Subba Rao, Guntoju Kalpana Devi, Suraya Mubeen, Badam Prashanth, Tazzeen Fatima, K. Reddy Madhavi, Voruganti Naresh Kumar, and Charan Yadav Chintalacheri

Abstract Nowadays, with the Big Data phenomenon, the need of the usage of feature selection (FS) methods is critical. FS can assist to address photograph analysis, and in reality it has been gaining importance within a rapid few years ago, however also to relieve the computational burden required for extracting records from the snapshots. An exhaustive assessment and evaluation of the latest contributions of FS to the field of image analysis is necessary. By eliminating unimportant features from the original set, selection of features significantly enhances the efficiency of texture classification, which is a key factor in machine learning performance. By selecting a characteristic, one can achieve accuracy in database type while also accelerating the class rate. The primary goal of the endeavor is to choose the most substantial skills in the function set to carry out a particular undertaking. Kullback–Leibler (KL) divergence approach showed that accuracy in classification is proven with the use of the present methods when feature selection is applied to Feature extraction.

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CRNN-Based Eye Behavior Analysis for Drowsiness Detection

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J. Sasi Kiran, Gurram Sunitha, Marri Sireesha, U. Mahender, K. Reddy Madhavi, Swathi Rudra & Voruganti Naresh Kumar

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Abstract

Deep learning plays a critical role in enhancing road safety through various applications and technologies. Deep learning is at the core of Advanced Driver Assistance Systems, which provide real-time feedback and warnings to drivers. Drowsiness detection is a critical aspect of ensuring road safety and preventing accidents, especially in long-haul driving and transportation sectors. Deep learning models can analyze driver behavior, including eye movement and facial expressions, to detect signs of drowsiness. Drowsiness detection systems can then issue warnings suggesting rest breaks to prevent accidents caused by drowsy driving. This research explores the development and evaluation of a Convolutional Recurrent Neural Network architecture for drowsiness detection from eye images. The CRNN-based design utilizes a synergistic combination of CNN and LSTM layers, offering a comprehensive solution for drowsiness detection that considers both spatial and temporal aspects of eye behavior. The proposed model leverages the Eye Aspect Ratio and Eye Closure Ratio as key features for accurate detection. The proposed CRNN-based model is evaluated against traditional machine learning and deep learning models. Experimental results reveal that the CRNN-based model achieved an impressive accuracy of 93.2%, outperforming compared models and showcasing its potential for real-world applications.

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Investigating the abnormalities of deep learning with customized architecture using deep learning 4J

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Abstract

You In most cases, doctors and the use of image processing tools can assess the placenta—the actual site of physical birth—during pregnancy. Models built using Machine Learning produce performance metrics such as Accuracy, ROC, Precision, Recall, and F-Measure, which quantify this support. This research makes use of the tailored strategy built into the Weka tool, namely the DeepLearning4j package.Using common architectures such as LeNet, VGGnet, ResNet, and Alexnet yields results that are comparable. By iterating over the input layer's Loss functions and the output layer's errors, DeepLearning4j evaluates and optimizes the suggested architecture based on its quality. The experimental results show that out of seven distinct loss functions, the one with the abbreviation "MCXENT" (meaning "Multi-class Cross Entropy") produces the most accurate and least error-prone results. Additionally, a maximum accuracy of 95.7% is obtained, which is considered the best performance. These findings lend credence to an additional machine learning strategy that employs an interactive development tool for gynecologists and offer fresh assurance in its efficacy.

Key words: DeepLearning4j / AlexNet / Placenta abnormalities / Multi-class Cross Entrophy / SoftMax / VGG / Loss Function / F-Measure / Precision / ROC

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Brain Tumor Detection and Segmentation Using Deep Learning Models with Dual Attention Mechanism

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Marri Sireesha, Gurram Sunitha, J. Prasanna Babu, Uma Mythraye Yelisetti, Bushra Tarannum, K. Reddy Madhavi & Sam Goundar

Part of the book series: Lecture Notes in Networks and Systems ((LNNS,volume 898))

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Abstract

Brain tumor segmentation is a critical task in medical image analysis with applications in diagnosis, treatment planning, and patient monitoring. Deep learning models have shown remarkable success in automating this process. This research presents an investigation into the integration of dual attention mechanisms into prominent deep learning architectures, namely TransFuse-L, U-Net, and ResNetU++. The selected deep architectures are evaluated with and without dual attention mechanism. They are trained and tested on BRaTS-2021 Task-1 Dataset which is a benchmark for brain tumor segmentation. Dual attention mechanisms, encompassing both spatial and channel attention, offer the potential to simultaneously capture local details and global context within medical images. The motivation behind this research lies in enhancing the interpretability and performance of existing models by enabling them to focus on salient features while considering broader image context. The experimental results demonstrate that the integration of dual attention mechanisms consistently leads to improved brain tumor segmentation performance across the selected deep architectures. The findings underscore the utility of dual attention mechanisms in enhancing the interpretability and predictive capabilities of deep learning models for brain tumor segmentation.

Measles Detection Using Deep Learning

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Md Mohammad Shareef, Gurram Sunitha, S. V. S. V. Prasad Sanaboina, Marri Sireesha, K. Reddy Madhavi, Ganapathi Antharam & Voruganti Naresh Kumar

Part of the book series: Lecture Notes in Networks and Systems ((LNNS,volume 898))

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Abstract

Measles is an infectious and potentially deadly viral disease. It continues to be a significant global health concern, necessitating accurate and efficient diagnostic tools for timely intervention. In this context, a deep learning-based solution utilizing the YOLOv5 architecture for automated measles detection in medical images is designed. Traditional methods for measles identification often rely on manual examination, which is time-consuming and prone to human error. The proposed YOLOv5-based model offers an approach to streamline this process, significantly enhancing the accuracy and efficiency of measles diagnosis. The novelty of the model lies in its ability to effectively distinguish between measles and non-measles cases in a wide range of medical images. To evaluate the proposed model, extensive experiments were conducted using MSID dataset. Experimental results demonstrate that YOLOv5-based model achieves an accuracy of 92%, with a balanced F1-Score of 0.92. Furthermore, the model's precision-recall curve showcases its ability to balance precision and recall, giving healthcare professionals the flexibility to adapt the model's performance to specific clinical requirements.

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Image reconstruction techniques using deep learning quality segmentation

Adidela Rajya Lakshmi[1*], Sara Suresh[2], Prashanth Mutalik Desai[3], Veerender Aerranagula[3], N. Mounika[4] and Namita Kaur[5]

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Abstract

Translational CT (TCT), in developing nations, a low-end computed tomography (CT) technology are relatively common. The limited-angle TCT scanning mode is often used with large-angle scanning to scan items within a narrow angular range, reduce X-ray radiation, scan long objects, and prevent detector discrepancies.. However, this scanning mode greatly reduces the picture quality and diagnostic accuracy due to the added noise and limited-angle distortions. A U-net convolutional neural network-based approach for limited-angle TCT image reconstruction has been created to reconstruct a high-quality image for the limited-angle TCT scanning mode (CNN). The limited-angle TCT projection data are first examined using the SART method, and the resulting picture is then fed into a trained CNN that can reduce artifacts and maintain structures to provide a better reconstructed image. Simulated studies are used to demonstrate the effectiveness of the algorithm designed for the limitedangle TCT scanning mode. In contrast to certain modern techniques, the developed algorithm considerably lowers noise and limited-angle artifacts while maintaining image structures.

Key words: Deep Learning / Network segmentation / Image reorganisation / CNN

Publisher note: A typographic mistake in the third affiliation has been corrected, on April 30, 2024.

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HEECCNB: An Efficient IoT-Cloud Architecture for Secure Patient Data Transmission and Accurate Disease Prediction in Healthcare Systems

Publisher: IEEE Cite This PDF

C. Veena ; Mulagundla Sridevi ; Kazi Kutubuddin Sayyad Liyakat ; Bishal Saha ; Sheri Ramchandra Reddy ; N Shirisha **All Authors**

Abstract:
The rapid expansion of the Internet of Things (IoT) in various fields has brought about significant advancements in data processing capabilities, in particular with the advent of IoT-cloud-based devices. Among these advancements, the healthcare system stands as one of the most intriguing IoT-Cloud integration uses cases. However, ensuring the security and privacy of patient data has become a critical concern, necessitating the development of robust protective measures. This research addresses the challenges of data security and computation overhead in the context of an IoT-cloud-based health system. A novel strategy dubbed Homomorphic Encryption with Elliptical Curve Cryptography integrated with Naive Bayes (HEECCNB) is put forth to address these problems. This approach is intended to enable precise disease prediction based on the gathered IoT sensor data while simultaneously providing good patient data privacy inside the IoT Health Cloud system. By employing homomorphic encryption, sensitive patient information can be securely processed and analyzed within the cloud environment without the need for decryption, preserving the confidentiality of the data. Furthermore, the integration of Elliptical Curve Cryptography enhances the security of the system by providing efficient and robust cryptographic operations. The proposed HEECCNB approach demonstrates promising results in both data protection and disease prediction. Through experiments conducted on the IoT Health Cloud scheme, the research validates the effectiveness of the projected method in safeguarding patient data and accurately predicting diseases based on IoT sensor data. Hence, the HEECCNB approach presents a compelling solution to the data security and computation overhead challenges faced in IoT-cloud-based health systems. Its successful implementation could significantly enhance the overall functionality and trustworthiness of such systems, facilitating the integration of IoT technologies in healthcare fo...

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Advancing Precision Heart Disease Diagnosis for Proactive Healthcare Management using RF-IGE

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Abstract— **Heart disease remains a leading cause of mortality worldwide, emphasizing the need for accurate and timely prediction to improve patient outcomes and reduce healthcare burdens. In this research, we present a novel approach to predict heart disease utilizing Random Forest with Information Gain Entropy (RF-IGE) as the predictive model. The combination of Random Forest and Information Gain Entropy aims to enhance the accuracy and efficiency of heart disease prediction, catering to the complex and heterogeneous nature of the disease. By leveraging the RF-IGE methodology, we analyze and identify the most informative features crucial for heart disease prediction. The model's robustness is evaluated using comprehensive datasets encompassing diverse patient profiles, ensuring its generalizability and applicability across different populations. The proposed predictive model exhibits promising results, demonstrating a high level of accuracy in distinguishing individuals with heart disease from healthy individuals. This research contributes valuable insights into the utilization of Random Forest and Information Gain Entropy in predicting heart disease, showcasing the potential for improved diagnosis and personalized treatment strategies. The ultimate goal is to develop a reliable and practical predictive tool that aids healthcare professionals in making informed decisions for early detection and optimal management of heart disease, ultimately leading to better patient care and outcomes.**

Keywords— Heart disease, Prediction, Random Forest, Information Gain Entropy, Accuracy and Efficiency

I. INTRODUCTION

In the past decade, cardiovascular disease has emerged as the primary global cause of mortality. The WHOs (WHO) estimates that 23.6 million people worldwide die from cardiovascular diseases each year, with myocardial disease and strokes in the brain contributing to 82% of those deaths. Machine learning methods, when applied without human intervention, exhibit higher accuracy and efficiency compared to other approaches [3].

Textual and visual inputs are the main sources of data for the MLs algorithm. The entire data set is then split into an instructional database and a data set for testing. The training dataset is used to develop the ML model, which can then be applied to the evaluation dataset. This trained model produces outcomes represented as A, B, and C. Machine learning techniques have found numerous practical applications across various domains. The issue of high dimensionality in Machine Learning is well-known, where researchers often deal with large datasets that cannot be easily visualized in 3D due to the curse of dimensionality [4]. ML methods classify and forecast cardiovascular disorders. It is possible to tell apart people with cardiac disease who are at high risk from those who are at low risk using an AI method [5]. Hypertension, diabetes, increased cholesterol, obesity, cigarette use, and family histories of coronary disease are associated risks for cardiovascular illnesses. Age, gender, and inherited variables are also important and are not changeable [4]. Also taken into account in the analysis is thalassemia, which is influenced by hereditary variables. High hypertension, smoking, elevated cholesterol, inactivity, obesity, physical sickness, anxiousness, using alcohol, and an unbalanced diet are other associated risks [6].

A suggested research [7] makes a substantial contribution by using machine learning-based techniques for cardiovascular disease prediction in healthcare. Several machine learning predictive techniques such as RRs, RFs, SVMs, DTs, KNNs, and NBs, have been utilised in the study [8] to sort patients into both beneficial and dangerous groups due to coronary artery disease. Techniques including minimum redundant operation, maximum relevance, shrinking, comfort, and selecting operators were used to find pertinent and related characteristics that have a substantial influence on the prediction. Approaches for cross-validation, such as k-fold verification, were used. Different categorization algorithms' efficacy was evaluated using performance indicators including recall, accuracy, AUC, F1-Score, and precision [9].

The research proposal has made significant contributions in the following aspects:

Deep Learning based vehicle image detection using Yolo V5 with Region-Based Convolutional Neural Network

Publisher: IEEE Cite This PDF

S. Swapna Rani ; Aditya Mudigonda ; S V Hemanth ; P.N. Sundararajan ; G. Vinoda Reddy ; G. Amirthayogam **All Authors**

Abstract:
Detecting and classifying vehicles is a modern technology with numerous uses. Administration and regulation of traffic is one of the primary uses. Projects utilizing image processing to prevent traffic accidents heavily rely on vehicle monitoring and detection. Monitoring and recording human movement in surveillance situations require the ability to follow moving objects. Considering its significance, it provides a valuable image processing-based vehicle detection technique—a vehicle tracking and detection system based on images. The recently released high-resolution road vehicle dataset supports deep learning-based vehicle detection and monitoring on the Python platform. It includes over 100 well-defined pictures taken from movies from various locations. This data is produced using a range of image processing methods. The most recent iteration of the YOLO model, the v5 model, was employed for detection. R-CNN is additionally utilized for model detection. The four stages in the Region-Based Convolutional Neural Network (RCNN) process are preprocessing, segmentation, feature selection, and classification. The first step is identifying moving vehicles accurately. Preprocessing the original image is necessary. This enhances the image's quality, valuable information extracted, or unwanted areas cropped out. Segmentation is the second step. The region's borders are established, and the entire image is divided into numerous smaller areas using a threshold. The vehicle image's most pertinent aspects or characteristics (features) that aid in precise detection are found in the third stage, feature selection. A region-based convolutional neural network (RCNN) is employed to determine the categorization. The Yolov5 method can be used to identify and categorize items. The Region-based Convolutional Neural Network (RCNN) approach enhances accuracy and temporal complexity over current segmentation algorithms.

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Predicting Chronic Kidney Disease using Machine Learning in the Early Stages

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B Mamatha ; Sujatha P Terdal **All Authors**

Abstract:
chronic kidney disease (CKD) is an illness that causes a decline in kidney function. The CKD early diagnosis is tough since it does not have initial symptoms. The early disease can stop the infection advancement with a well-timed diagnosis. The research aim is to implement and compare the various algorithm's performance and identify the best combinations that can provide better detection accuracy. We have found the solution using Machine Learning (ML) approaches that can achieve risk minimization. Seven ML algorithms have been utilized in this work with Accuracy, Precision, Recall, F1-Score, and Support as model evaluation parameters. In this comparison, RF and AdaBoost algorithms provided the uppermost accuracy worth 99%. Finally, data analysis is performed such as frequency distribution, Correlation between the features, Feature distribution plots, classification, and prediction plots. The domain of predictive analysis of CKD can be significantly enhanced by ML algorithms. By collaborating with them, healthcare professionals will be able to design a computer-aided diagnosis system that can enhance their ability to treat patients effectively.

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Resource Allocation Using Improved Grey Wolf andThe Ant Colony Optimization Using in Cloud Environment

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Abstract:
Cloud computing is the latest trend in data storage, processing, visualization, and analysis. As more government agencies and commercial businesses adopt cloud computing, its usage has grown dramatically. It entails distributing resources dynamically as required in order to offer clients secure services. Cloud computing is another rapidly expanding segment of the computer industry. Users can use this paradigm to access computational resources such as Internet streaming. Scheduling and resource distribution are important but difficult issues in cloud computing. To overcome the issues using Ant Optimization (ACO) and Improved Gray Wolf (IGW) for allocating the resource in cloud. Initially, we monitoring the performance based on send and receive data from cloud server and user. Then second step using Improved Gray Wolf (IGW) to allocating the task based on the position and weights. And Then Third step is ACO, is connecting with the second step and its evaluating and analysis the sequence of data position. And enhances cloud service performance through the use of fuzzy algorithms. In order to estimate cloud server workloads and resource requirements, fuzzy rules are used to route resource volume and usage throughout the resource allocation process. Based on estimated workloads, determine the completion time for each cloud server. Experiments were conducted using a Java programming environmentand compared with existing work in this direction in terms of resource utilization, resource allocation, Recourse utilization, CPU load and performance, and cloud performance improvements.

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