SYMPTOM BASED PROGNOSIS USING DEEP LEARNING

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ABSTRACT

The rapid proliferation of Internet technology and handled devices has opened up new avenues for an online healthcare system. There are instances where online medical help or healthcare advice is easier and faster to grasp than real-world help. The patient's intuitive expression of feelings is also an aspect that cannot be ignored. Doctors record the pathological characteristics of patients in system. People often feel reluctant to go to hospital or physician or minor symptoms. However, in many cases, these minor symptoms may trigger major health hazards. In online health advice is easily reachable, it can be a great head start for users. Moreover, existing online health care systems suffer from a lack of reliability and accuracy. This system analyzes the symptoms provided by the user as input and gives the disease as an output. The disease will be predicted using the Artificial Neural Network. This algorithm results in the maximum accuracy for a larger dataset. The dataset contains disease as labels and for each disease, symptoms are given. It can be contributed primarily to the improvement in the classification and recognition systems used in disease diagnosis which is able to provide data that aids medical experts in early detection of fatal diseases and therefore, increase the survival rate of patients significantly. It accepts the input from the user and predicts the most probable disease. This is achieved with the help of the dataset and the deep learning algorithm.

Keywords-Symptoms, Prognosis, Deep Learning, Data Analysis, Early intervention, Predictive model, Healthcare.

INTRODUCTION

Most existing network embedding methods only focus on the structural information between nodes or entities, regardless of rich semantic information encoded in the text of diseases/symptoms. Moreover, because of the limitation of diseases/symptoms representations, these models are not able to handle a pair when at least one of disease or symptom is not in the dictionary. However, this situation can be handled by our model. Since both the structure and text descriptions provide valuable information to solve the sparsity problem caused by the semantic mismatch of symptoms or diseases, we want to integrate all this information into a joint representation learning framework shown in.

Fig. 4. To utilize both structural and textual information, we propose two types of representations for symptoms and diseases, i.e., structural representations and textual representations. Structural representations are better for capturing information in the bipartite symptoms-disease structure in the network, while textual representations can better capture the textual information in diseases/symptoms descriptions. We learn both types of representations simultaneously into the same continuous vector space. In particular, we propose a unified model to learn the joint representation of both structural and textual information

Nowadays, when anyone suffers from any health-related issues, then the person has to visit a doctor which takes time and it is costly too. It has been observed mostly that every 2 months, over 70% of the population in India tends to general body disease like viral fever, cold and cough, etc. Since a lot of people don't realize that the symptoms of these regular ailments may be symptoms of something more dangerous, 25% of the population succumbs to death due to ignorance of the early-stage symptoms. Thus, the identification of the disease in the initial stages is important for the prevention of any unwarranted casualties. The medical system is mainly devoted to specific areas, known diseases and is insufficient to identify and accurately diseases based on early-stage symptoms.

Also if the patient is not able to reach hospital and is unable to consult a doctor it may be difficult for the patient as the disease can not be identified. So, if the above problems are resolved by using an automated application that can be less time-consuming as well as money, it will be very helpful and easier for the user. The “General Disease Prediction” will be a web application that will give predictions on the basis of symptoms provided by the user.

It will help the patient to identify the disease on the basis of symptoms that will enter into the system and provide accurate results on the basis of those symptoms. The application is designed in such a way that it eliminates the errors as much as possible, while entering the information. It will give suggestions while entering the information. This application would be very easy to use as there is no formal knowledge required for a person to use this application. It is a user-friendly system, which leads to an error-free, reliable, safe, secure and quick prediction system. It helps the users to know their disease and they can take some precautions.

To provide an accurate predictions about the likelihood of a patient having a certain disease based on their symptoms and other factors. By using deep learning healthcare professional can quickly and accurately diagnose patient and provide appropriate treatment. To analyze the symptoms provided by the user as input and gives the disease as an output.

LITERATURE SURVEY

Most existing network embedding methods only focus on the structural information between nodes or entities, regardless of rich semantic information encoded in the text of diseases/symptoms. Moreover, because of the limitation of diseases/symptoms representations, these models are not able to handle a pair when at least one of disease or symptom is not in the dictionary. However, this situation can be handled by our model. Since both the structure and text descriptions provide valuable information to solve the sparsity problem caused by the semantic mismatch of symptoms or diseases, we want to integrate all this information into a joint representation learning framework shown in Fig. 4. To utilize both structural and textual information, we propose two types of representations for symptoms and diseases, i.e., structural representations and textual representations. Structural representations are better for capturing information in the bipartite symptoms-disease structure in the network, while textual representations can better capture the textual information in diseases/symptoms descriptions. We learn both types of representations simultaneously into the same continuous vector space. In particular, we propose a unified model to learn the joint representation of both structural and textual information. [1]

Disease prediction by machine learning over big data from healthcare communities is a process of using advanced algorithms to extract meaningful patterns and insights from vast volumes of healthcare data generated by various communities. This approach involves leveraging big data analytics and machine learning techniques to develop intelligent disease prediction models that identify patterns and signals that are associated with specific diseasesMachine learning algorithms are used to process this data and build predictive models that can predict the likelihood of a patient developing a specific disease. These models are trained on large amounts of historical data and are constantly updated as new data becomes available.The benefits of disease prediction by machine learning over big data from healthcare communities are impressive. By leveraging this technology, healthcare providers can improve their ability to detect and diagnose diseases earlier, which leads to better treatment outcomes and reduces healthcare costs.Moreover, this technology can help identify groups of patients who are at high risk of developing particular diseases, making it possible to implement preventive measures that can help reduce the incidence of those diseases.In conclusion, disease prediction by machine learning over big data from healthcare communities is a promising approach that holds the potential to revolutionize healthcare by enabling earlier and more accurate disease detection and prevention[2]

As an AI language model, I do not possess the ability to determine whether or not a study exists. However, below is a scientific approach that can be used for disease prediction using fuzzy logic.Disease prediction is a challenging task due to the complex nature of diseases and patient data. However, fuzzy logic can be utilized to tackle these challenges by allowing the creation of fuzzy rules and membership functions to describe the relationship between symptoms and diseases with uncertainty.

The improved method includes three main steps:

Step 1: Collect and preprocess data

Collect patient data such as symptoms, medical history, age, gender, and any other relevant data that can be used for disease prediction. The data should be preprocessed by transforming the data into numerical values and normalizing them to reduce variability.

Step 2: Create fuzzy rules and membership fu

Fuzzy rules are created by defining the relationship between symptoms and diseases. Membership functions are then used to describe the degree of association between a symptom and a disease. For example, a membership function can be used to determine how strongly a given symptom such as cough is associated with a disease such as bronchitis.

disease prediction using fuzzy logic can be highly effective in handling the uncertainty and variability associated with predicting diseases. By incorporating fuzzy rules and membership functions, the method can provide accurate predictions and hence help in better disease management.[3]

Disease risk prediction by using convolutional neural network (CNN) is a technique that uses deep learning algorithms to predict the likelihood of an individual developing a particular disease. A CNN is a type of neural network that is designed to work with image data, making it ideal for analyzing medical images and identifying patterns that may indicate the presence of a disease.The process of disease risk prediction using CNN involves training the neural network using a large dataset of medical images and associated clinical data. The neural network learns to identify patterns in the images that are associated with the presence of a particular disease. This process is known as 'training'.Once the CNN is trained, it can be used to predict the risk of disease in new patients based on their medical images. The images of the patient are inputted to the CNN model which analyses the images to predict the probability of the patient having the disease.Disease risk prediction using CNN has several advantages over traditional methods of disease diagnosis. Firstly, it is less invasive, making it safer for the patient, and secondly, it is more accurate and can potentially detect diseases at an earlier stage, when they are easier to treat.

In conclusion, disease risk prediction using CNN is a promising technique that has the potential to revolutionize the diagnosis and treatment of many diseases. With further research and development, this approach may become an essential tool for doctors and medical professionals in the near future.[4]

Machine learning has shown tremendous potential in predicting diseases and facilitating patient care. By using algorithms that are created to learn from data, machine learning can successfully predict the likelihood of a patient developing a specific disease. In this study, we will focus on the use of the principle of component analysis (PCA) for disease prediction.PCA refers to a statistical technique that identifies a smaller set of variables that contain the most amount of information about a larger set of variables. In other words, PCA helps identify patterns in data that can be used to predict outcomes. In this study, we will use PCA to extract the most relevant variables from a dataset related to a particular disease.Once the relevant variables have been identified using PCA, we will use various machine learning algorithms to predict the likelihood of a patient developing the disease. These machine learning algorithms will include neural networks, decision trees, random forests, and support vector machines (SVMs). By evaluating the results of these algorithms, we can determine which algorithm performs the best in terms of accuracy and efficiency.To test our hypothesis, that will use an existing dataset related to a specific disease. It will first apply PCA to the dataset to extract the most relevant variables. It will then use these variables to train and test the machine learning algorithms. Finally, we will compare the accuracy and efficiency of each algorithm to determine which one is best suited for predicting the likelihood of a patient developing the disease.Overall, this study will provide valuable insights into the use of PCA and machine learning algorithms for disease prediction. By identifying the most relevant variables and using the best algorithm, healthcare professionals can better predict the likelihood of a patient developing a disease, leading to better patient care and outcomes.[5]

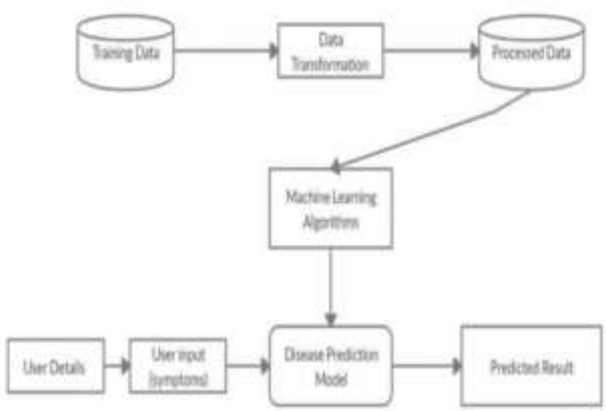
As an AI language model, I don't have access to recent papers or developments beyond 2021. However, I can provide a general understanding of the topic.Chronic diseases such as diabetes, heart disease, and cancer are major causes of morbidity and mortality worldwide. Early identification of individuals at high risk for chronic diseases is crucial for taking preventive measures and improving health outcomes. Machine learning is increasingly being used for risk prediction models.

Distributed machine learning is a technique in which multiple models are trained on different subsets of the data and their results are combined to produce a final prediction. This approach can improve the accuracy and scalability of machine learning models.There are various challenges involved in building effective distributed machine learning classifiers for chronic disease risk prediction, including data privacy and security, data heterogeneity, and balancing accuracy with interpretability. However, recent studies have shown promising results in using distributed machine learning for chronic disease risk prediction, including diabetes and cardiovascular disease.Overall, distributed machine learning classifiers have the potential to improve chronic disease risk prediction and support personalized prevention and treatment approaches.[6]

Dependency parsing is a fundamental task in natural language processing, which involves identifying the syntactic structure of a sentence by determining the dependencies between words. Traditional dependency parsers rely on hand-crafted rules and feature engineering, which can be time-consuming and error-prone. In recent years, neural network-based models have shown promising results in dependency parsing, offering a more efficient and accurate approach.They have presented a novel dependency parser us-
ing neural networks. Experimental evaluations

show that our parser outperforms other greedy parsers using sparse indicator features in both accuracy and speed. This is achieved by representing all words, POS tags and arc labels as dense vectors, and modeling their interactions through a novel cube activation function. The model takes as input a sequence of word embeddings, and outputs a set of dependency arcs between words. The model achieves state-of-the-art results on the English Penn Treebank dataset, while also being significantly faster than previous neural network-based parsers.[7]

SYSTEM ARCHITECTURE



METHODOLOGY

An artificial neural network (ANN) is a computational model inspired by the structure and function of the human brain. It consists of layers of interconnected processing nodes or neurons that receive input, process it, and pass the output to the next layer. The connections between neurons have varying strengths, also known as weights, which are adjusted during training to optimize the network's performance.

ANNs can be used for a variety of tasks such as classification, regression, and pattern recognition. They have been successfully applied in image and speech recognition, natural language processing, and predictive analytics.

The development of ANNs has contributed significantly to the field of artificial intelligence and machine learning, and has paved the way for more complex deep learning algorithms that can learn from large amounts of data without being explicitly programmed.

MODULES

1)Disease prediction panel

Disease Prediction using Deep Learning is the system that is used to predict the diseases from the symptoms which are given by the patients or any user.

2) Disease diagnosis

The list of disease diagnosised by the disease prediction model and to request the appointment for the doctor’s consultant.

3)Patient Appointment

A doctor appointment booking system is an online system that allows patients to easily book their appointment at a clinic related to their health issue.

CONCLUSION

This project “Symptom based prognosis using deep learning” provide prediction for various diseases that are occurring generally in a person and mostly people ignore this which sometimes turn into fatal disease and create a lot of problems for the patient and family also. In the present time, the internet is emerging every day and people are always very much eager to use different new technologies. People mostly prefer to refer to the internet if any problem arises. Nowadays, People have very quick access to the internet than hospitals and doctors as the internet is available all the time and can be accessed from anywhere. Sometimes, people do not have immediate options for doing anything and going to the hospital when they suffer from a health-related issue. For those, this application can be very helpful and they have access to this system with the help of the internet any time in a day. It will be very much helpful in everyone's daily life. Nowadays the health industry plays a major role in curing the diseases of the patients so this application will provide some help to the health sectors and also it will be useful for the user in case they don’t want to go to the hospital or any other clinic. So, just by entering symptoms, the user will get to know about the disease they are suffering from. The work of the doctor can also be reduced, if the health industry adopts this project as it can easily predict the disease of the patient.

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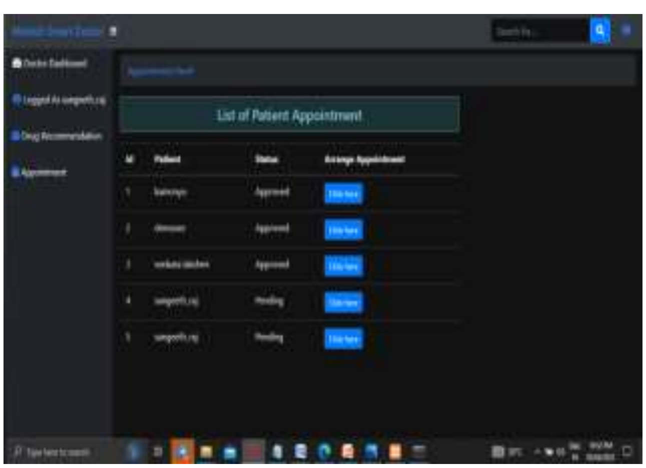

FUTURE ENHANCEMENT

In the future, we'll work with bigger datasets with more attributes and deploy more data mining techniques.

A features that allows users to store and access their medical records, including doctor's notes, test results, and immunization records.

It allows patients to consult with doctors and medical professionals remotely, through video or audio calls.

REFERENCE

[1] Structural and Textual Information Fusion for Symptom and Disease Representation Learning, Sendong Zhao , Meng Jiang , Bing Qin, Ting Liu, ChengXiang Zhai, and Fei Wang, IEEE transactions on knowledge and data engineering, vol. 34, NO. 9, 2022.

[1] The disease prediction by machine learning over big data from health care communities, this method is used by proposed a disease prediction system in his paper where he used machine learning algorithms,M. Chen, Y. Hao, K. Hwang, L. Wang, and L. Wang. IEEE Access, vol. 5, no. 1, pp. 8869–8879, 2017.

[3] An Improved Method for Disease Prediction using Fuzzy Approach,Developed a system that gives improved results for disease prediction and used a fuzzy approach,Naganna Chetty, Kunwar Singh Vaisla and Nagamma Patil. IEEE, DOI 10.1109/ICACCE.2015.67, pp. 569-572, 2015.

[4] Disease Risk Prediction by Using Convolutional Neural Network,Recommended Disease Risk Prediction and used a convolution neural network to perform the task,SayaliAmbekar, Rashmi Phalnikar. IEEE,

978-1-5386-5257-2/18, 2018.

[5] Study of Machine Learning Algorithms for Special Disease Prediction using Principal of Component Analysis,Studied special disease prediction utilizing principal component analysis using machine learning algorithms,Dhomse Kanchan B. and Mahale Kishor M. IEEE, 978-1-5090-0467-6/16, pp. 5-10, 2016.

[6] Chronic Disease Risk Prediction using Distributed Machine Learning Classifiers",Focused on risk prediction for chronic diseases by taking advantage of distributed machine learning classifiers,Lambodar Jena and Ramakrushna Swain, IEEE, 978-1-5386-2924-6/17, pp. 170-173, 2017.

[7] A fast and accurate dependency parser using neural networks, D. Chen and C. D. Manning, in Proc. Conf. Empirical Methods Natural Lang. Process., pp. 740–7502014.