



Patient Condition Classification And Disease Prediction

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Abstract

Technology has revolutionized the health domain largely. Here the Classifier calculates the probabilities of the disease. Based on the result, the patient can contact the doctor accordingly for further treatment. It is an exemplar where technology and health knowledge are sewn into a thread perfectly with a desire to achieve “prediction is better than cure”. The use of the internet has been stimulating curiosity among people and, if it of any kind is, they are trying to find a solution to their problems through the internet only. It is a matter of fact that people have much easier access to the Internet than hospitals and doctors. This Disease Prediction system is a web-based application that predicts the most probable disease of the user in accordance with the given symptoms with the help of the data sets collected from different health-related sites. Button for emergency cases which contacts the nearest Hospital with an Ambulance. Simple UI so that users of all ages can navigate through the application easily. Symptoms and disease prediction. Patient condition classification. Customer feedbacks are accepted. Finds specialized Doctors for the condition that the patient is dealing with from within their locality. Avoids misdiagnosis.

Virtual Advice from doctors in emergency situation to minimize further damage and to make time until medical help arrives(ex. CPR). Easy access for emigrants to find nearby medical support.

Keywords—Feature extraction

I. Introduction

Technology has greatly impacted healthcare. This project aims to develop a web-based disease prediction system using data mining techniques like classification. It gathers, refines, and classifies patient data to train an intelligent agent, which calculates disease probabilities based on symptoms. Users can then consult a doctor without visiting a clinic. The system provides urgent guidance, suggests specialists, offers virtual advice in emergencies, and includes features like symptom prediction, patient classification, feedback, and appointment scheduling. It ensures easy navigation and accessibility, even for emigrants, to nearby medical support. This Disease Prediction system is a web-based application that predicts the most probable disease of the user in accordance with the given symptoms with the help of the data sets collected from different health-related sites. It often happens that someone nearer or dearer to

you may need a doctor's help. Button for emergency cases which contacts the nearest Hospital with an Ambulance. Simple UI so that users of all ages can navigate through the application easily. Symptoms and disease prediction. Patient condition classification. Customer feedbacks are accepted. Finds specialized Doctors for the condition that the patient is dealing with from within their locality. Avoids misdiagnosis.

RESEARCH OBJECTIVE

To develop a robust and accurate disease prediction model using data mining techniques and machine learning algorithms, capable of identifying various diseases based on patient symptoms.

To explore and implement various classification algorithms (e.g., decision trees, random forests, support vector machines) to determine the most effective model for disease prediction

II . LITERATURE REVIEW

Availability of medical data and the potential for early intervention. Data mining techniques, particularly machine learning algorithms, have demonstrated significant promise in developing accurate and efficient models for these tasks. This review explores the existing literature on disease prediction and classification, focusing on the methodologies, challenges, and applications in the field.

A common approach involves collecting and preprocessing patient data from electronic health records (EHRs), clinical databases, and other relevant sources. This data is then cleaned and prepared to handle missing values, outliers, and inconsistencies. Feature engineering techniques are employed to extract relevant information from raw data, such as patient demographics, medical history, and laboratory results.

Machine learning algorithms, including supervised and unsupervised methods, are applied to train predictive models. Supervised learning techniques, such as decision trees, random forests, support vector machines, and neural networks, are commonly used to classify instances based on their attributes. Unsupervised learning methods, like clustering and dimensionality reduction, can be employed to identify patterns and reduce the complexity of the data.

The performance of these models is evaluated using metrics such as accuracy, precision, recall, F1-score, and AUC. Cross-validation techniques are employed to prevent overfitting and ensure generalizability.

Disease prediction and classification have found applications in various areas, including chronic diseases (e.g., diabetes, heart disease, cancer), infectious diseases (e.g., influenza, COVID-19, Ebola), and mental health disorders. However, challenges such as data quality and quantity, model interpretability, and ethical considerations need to be addressed.

III. PROPOSED SYSTEM

This system is used by end-users. The system will predict disease based on symptoms. This system uses latest Technology. This system is for those people who are always aware about their health. So, there is a feature for the awareness of health Disease Predictor . which recognize disease related to symptoms.

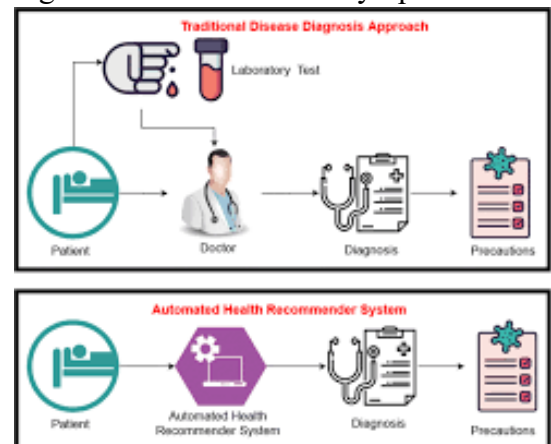


Fig. 1: System Design

A. Data collection

Data collection has been done from the internet and public health cares . And check no dummy values are entered.

B. Feature extraction

Feature extraction involves identifying and collecting relevant information (features) from the pre data.

C. Diseases Detection

It is an web application. which predicts diseases that the user may have. It also displays a list of doctors from the user's provided city who can cure at least one of the predicted diseases. More efficient and robust Data Mining and Machine Learning algorithms that provide well structure and comparatively larger Datasets that are well known for their accurate prediction can replace the current algorithm. We can also add features like registering for doctor's appointments .

D. Administrator

Using this application admin can login and manage the general details to be displayed for public access. Admin can also manage other four users of the system. Admin register all users of system. Medical Reports are amongst the most intensive and diverse processes in a Health care Management Information System. In this lab module, I am proposing an efficient and end-to-end framework for generating investigation test reports. The framework involves a novel template designer for result entry, a structured format for storing result entry template and data into suitable for reports and Medical Records. With extensive experimental evaluations, we show that the proposed framework significantly out performs traditional methods of generating reports. And also manage feedbacks.

E. Hospital / Doctor

Using this application credentials hospital can keep track of booking details Hospitals and healthcare facilities improve the quality of healthcare services, reduce operating costs, and improve the revenue cycle. Hospitals matter to provide and often mark central points in their lives. clinics typically provide non-emergency outpatients care that's routine or preventive. Although hospitals can also provide outpatients services, they focus more on proving inpatient care.. Here only one click the hospital can get all the reports about the patient and booking, review.

F. Users

Using this application credentials patients can login and view nearby hospitals and doctors and they can book and post reviews. The patient module contains all details about patients such as name, age, gender, date of birth, blood group and address. A patient system can ensure that you effectively schedule any future appointments. Thus, allowing you to follow up with patients and reduce no-shows, It make it simple to book appointment for patients as well.

IV. ALGORITHMS

Machine Learning

Machine learning is a field of artificial intelligence that is quickly developing. It enables computers to automatically learn from experience, analyses enormous amounts of data, and produce results. It stands out for its ability to spot intricate patterns, adjust to shifting circumstances, and make wise predictions or conclusions. Machine learning is the extraction of knowledge from data based on algorithms created from training Classification Algorithms.

1. Linear algorithms

Linear algorithms are ones that can be described mathematically by a linear equation. This indicates a linear relationship between the attributes and the target parameter.

a. Logistic Regression :

A statistical technique called logistic regression is used to address binary classification issues.

b. Support Vector Machines (SVM) :

SVM is an adaptable technique that may be used for classification as well as regression. It finds the best hyper plane for differentiating several classes or predicts the value of a continuous targeted parameter.

2. Non-Linear Algorithms

A non-linear relationship can be seen in the association between the characteristics and the goal variable.

a. Decision Tree Classification:

It is regarded as a highly successful and adaptable classification tool. It is utilized in picture categorization and pattern recognition. Due to its exceptional adaptability, this approach is utilized for classification in highly intricate issues. Furthermore, it demonstrates proficiency in handling challenges involving multiple dimensions. The structure consists of three components, namely the root, nodes, leaves.

b. Nave Bayes:

A nonlinear framework based on the Bayes theorem. The Bayes theorem is an algebraic equation that calculates the likelihood of an event occurring given the likelihood of other events occurring

c. Random Forests:

It is a method of supervised learning that can be used to solve regression and classification problems. These algorithm's four crucial steps

are as follows:

Linear Vs Non-Linear Algorithm For Diseases Prediction

Non-linear algorithms are preferred over linear algorithms for disease prediction via because non-linear algorithms can capture complex relationships and interactions among numerous components that contribute to disease development, allowing for more accurate and nuanced predictions. Linear algorithms, on the other hand, presume a linear relationship between predictors and outcomes, which may be insufficient to represent the complexity of diseases and their risk factors.

V. RESULTS AND CONCLUSION

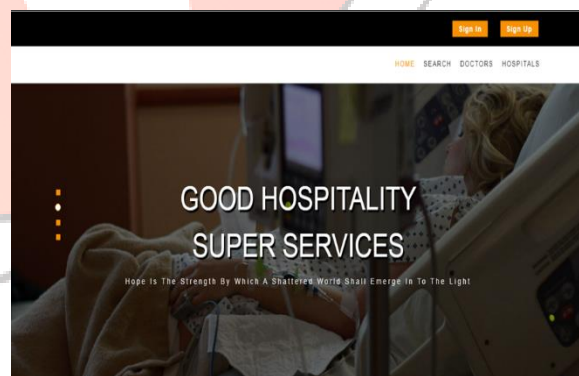


Fig. 2:Shows home page

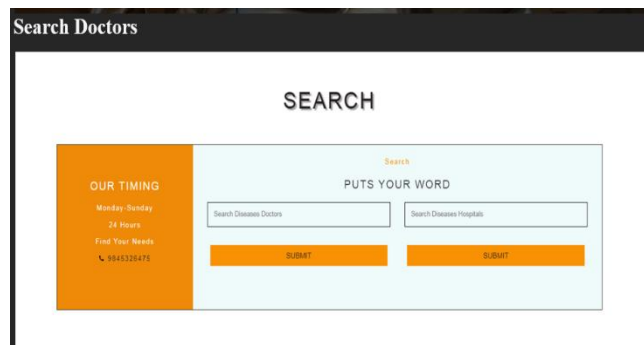


Fig. 3:Shows Disease searching page

VI. Conclusion

The current manual maintenance of patient records in healthcare systems presents numerous challenges. These records are often inaccessible to doctors, leading to compromised patient care, repeated prescriptions or tests, increased costs, and extended treatment times. Additionally, the vulnerability of these records to unauthorized access poses a significant security risk. The lack of privacy and security can discourage patients from disclosing their actual health issues, further hindering effective care. To address these problems, this project aims to develop a more efficient and cost-effective electronic health record system that prioritizes data security and patient privacy. By automating record keeping and improving data accessibility, this system can streamline processes, reduce errors, and enhance the overall quality of healthcare.

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VII. REFERENCE

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