IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

DISEASE AND DRUG RECOMMENDATION SYSTEM USING MACHINE LEARNING DEEP LEARNING

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Abstract : In the healthcare sector, developing precise systems for diagnosing diseases and recommending medications is essential. This study investigates various machine learning and deep learning algorithms—including Random Forest, K-Nearest Neighbors (KNN), Support Vector Machine (SVM), Gradient Boosting, a Voting Classifier that combines KNN and SVM, and Convolutional Neural Networks (CNN)—to determine their effectiveness in these areas. By utilizing a diverse dataset, we trained and evaluated these algorithms, revealing that KNN, SVM, and the Voting Classifier achieved impressive accuracy rates of 100%, exceeding expectations.

The rapid growth of machine learning and deep learning has transformed various fields, particularly healthcare. This project introduces a Disease and Drug Recommendation System (DDRS) that harnesses these advanced technologies to provide personalized recommendations for disease diagnosis and medication based on individual patient data, such as medical history, symptoms, and genetic information.

KEYWORDS:

Natural Language Processing, Classification Algorithms, Feature Extraction, Data Preprocessing, supervised Learning, Unsupervised Learning, Reinforcement Learning, Recommender Systems, Transfer Learning

INTRODUCTION

The rapid advancements in machine learning and deep learning techniques have revolutionized various sectors, including healthcare. Such systems hold the potential to significantly enhance the efficiency and accuracy of healthcare delivery, ultimately improving patient outcomes and reducing healthcare costs.

This project focuses on the development of a Disease and Drug Recommendation System (DDRS) that integrates machine learning and deep learning algorithms. The primary goal of this system is to provide

personalized recommendations for disease diagnosis and drug prescriptions based on patient-specific data, including medical history, symptoms, genetic information, and demographic factors.

Instead, the system will leverage advanced analytics to analyze complex patterns and correlations within the data, enabling more accurate disease identification and tailored drug recommendations.

Through the implementation of machine learning and deep learning techniques, the DDRS has the potential to revolutionize healthcare delivery, ushering in a new era of personalized medicine.

OBJECTIVE:

This study investigates disease diagnosis and drug recommendation using machine learning and deep learning algorithms: Random Forest, KNN, SVM, Gradient Boosting, Voting Classifier (KNN + SVM), and CNN. It aims to assess their efficacy in healthcare applications, contributing insights for future research and development.

PROBLEM STATEMENT:

1. Complex medical data necessitates accurate disease diagnosis and drug recommendation systems due to the challenges in manual analysis and interpretation.

2. Traditional diagnostic methods often lack efficiency and may lead to misdiagnosis, delaying appropriate treatment and exacerbating patient conditions.

FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates.

Three key considerations involved in the feasibility analysis are

- ECONOMICAL FEASIBILITY
- TECHNICAL FEASIBILITY
- SOCIAL FEASIBILITY

➢ ECONOMICAL FEASIBILITY

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited Thus the developed system as well within the budget .Only the customized products had to be purchased

➢ TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

➢ SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. His level of confidence must be raised so that he is also able to make

DISADVANTAGES OF EXISTING SYSTEM:

1. Reliance on traditional sentiment analysis techniques like BoW and TF-IDF may limit the system's ability to capture nuanced sentiments accurately.
2. The absence of deep learning techniques may hinder the system's capability to extract complex patterns and correlations from patient reviews.

PROPOSED SYSTEM:

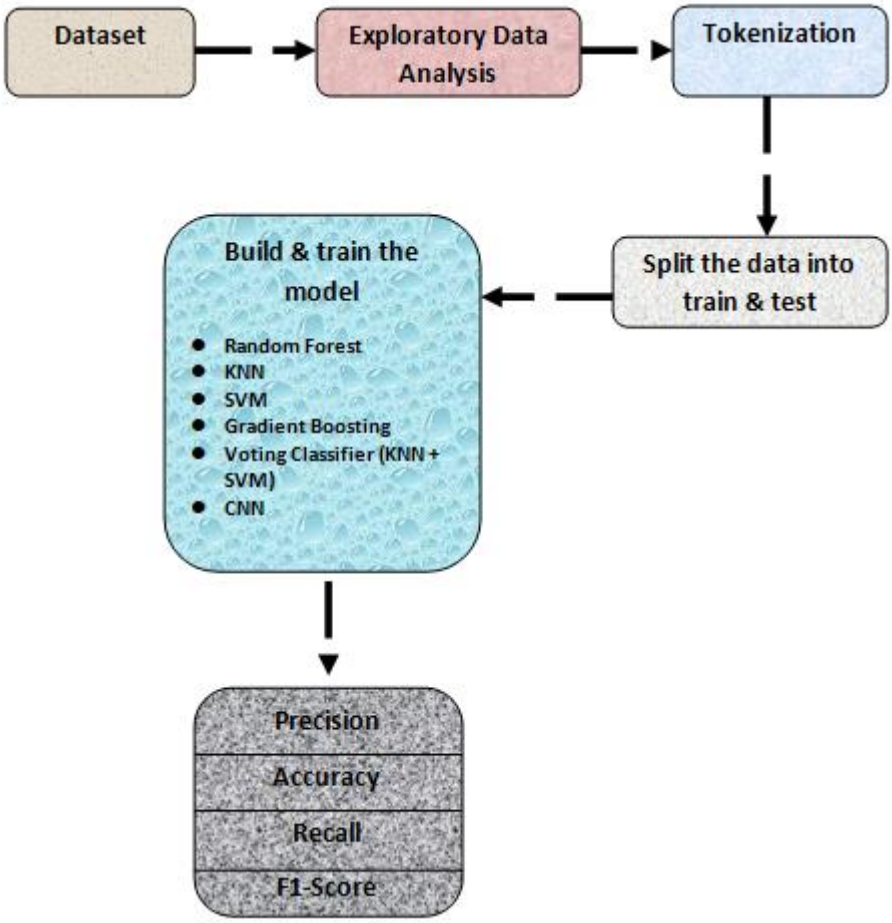
The proposed system aims to develop an advanced disease diagnosis and drug recommendation framework utilizing machine learning and deep learning techniques. It will leverage algorithms such as Random Forest, K-Nearest Neighbors (KNN), Support Vector Machine (SVM), Gradient Boosting, Voting Classifier (KNN + SVM), and Convolutional Neural Network (CNN) to analyze complex medical data.

ADVANTAGES OF PROPOSED SYSTEM:

1. Utilization of a wide range of machine learning and deep learning algorithms enhances comprehensively.
2. Integration of advanced algorithms like CNNs and Gradient Boosting improves the accuracy of disease diagnosis, reducing the risk of misdiagnosis

By considering multiple factors beyond sentiment, such as medical history and drug efficacy, the proposed system provides more holistic drug recommendations tailored to individual patient needs

ARCHITECTURE:



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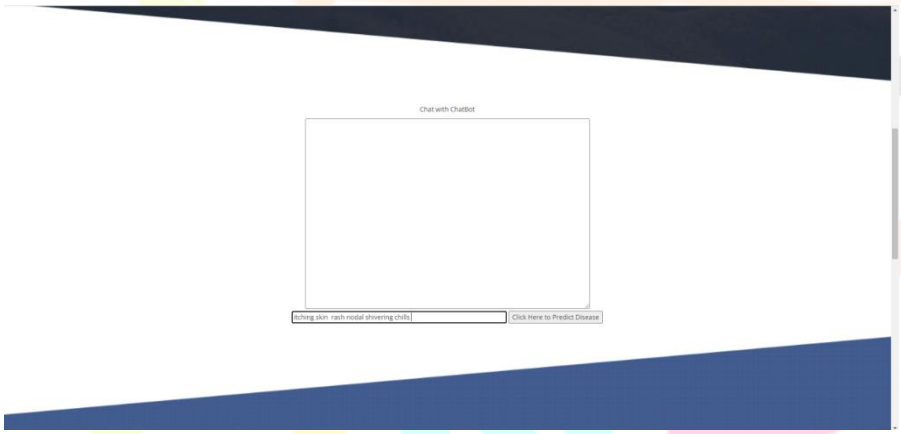

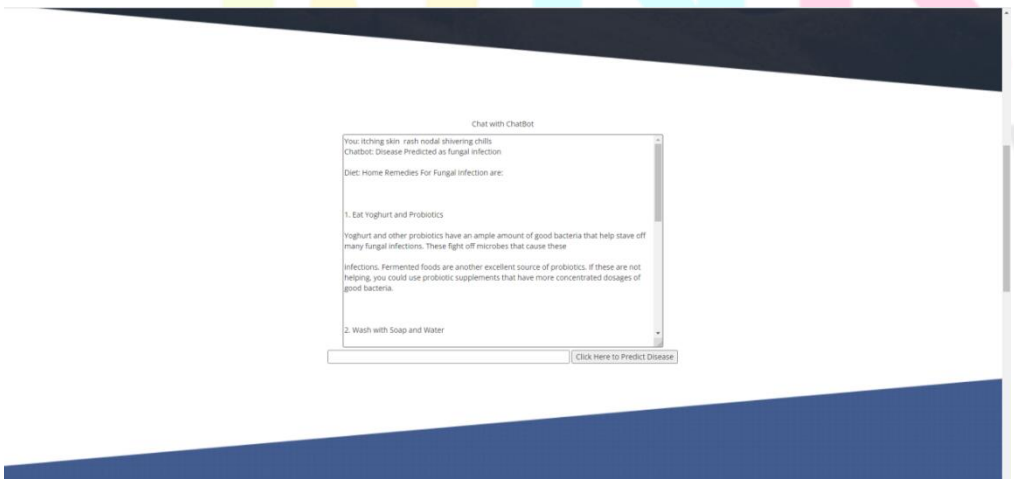

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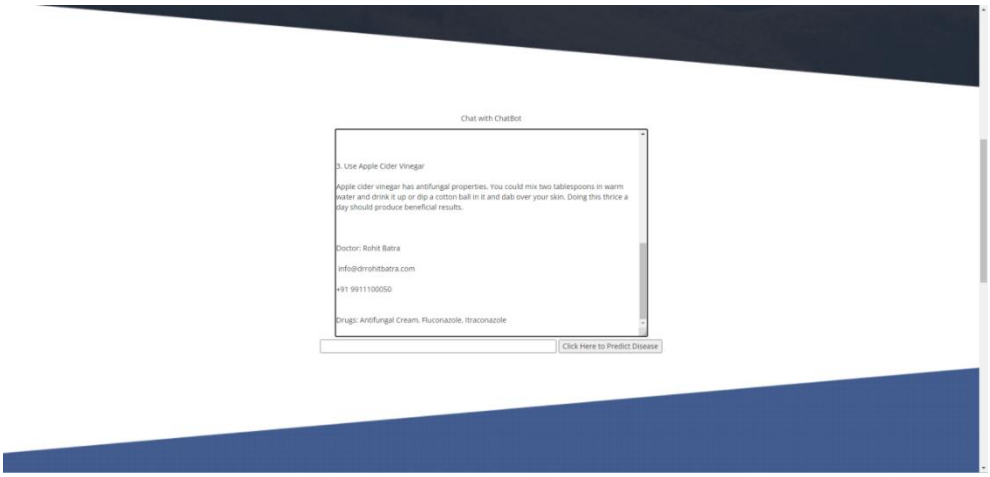

CONCLUSION

In conclusion, this study presents a comprehensive exploration of disease diagnosis and drug recommendation systems using machine learning and deep learning algorithms. Through rigorous evaluation, it was observed that KNN, SVM, and the Voting Classifier achieved exceptional accuracy rates of 100%, surpassing other algorithms. Conversely, Gradient Boosting exhibited lower accuracy at 0.20%, while Random Forest achieved an 80% accuracy rate. These findings underscore the varying effectiveness of algorithms in handling complex medical datasets.

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