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Disease Prediction and Diagnosis Using Machine Learning

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Abstract: ***With big data growth in biomedical and healthcare communities, accurate analysis of medical data benefits early disease detection, patient care, and community services. However, the analysis accuracy is reduced when the quality of medical data is incomplete. Moreover, different regions exhibit unique characteristics of certain regional diseases, which may weaken the prediction of disease outbreaks. Healthcare is very important to lead a good life. However, it is very difficult to obtain the consultation with the doctor for every health problem. The idea is to create a medical Chatbot using Artificial Intelligence that can diagnose the disease and provide basic details about the disease before consulting a doctor. This will help to reduce healthcare costs and improve accessibility to medical knowledge through medical Chatbot. The chatbots are computer programs that use natural language to interact with users. The Chatbot stores the data in the database to identify the sentence keywords and to make a query decision and answer the question.***
Keywords: Chatbot, classification, disease detection, health care, patient diagnosis

I. INTRODUCTION

Machine learning is an arising approach that helps in determination of diseases using model information or past data. The Machine learning algorithm has two passes: Training and Testing. A Forecast of a disease by using a patient's symptoms and history machine learning technology is battling for past many years. Machine Learning technology gives a decent stage in the clinical field, so a medical care issue can be solved proficiently. We are applying machine learning to maintain complete hospital data Machine learning technology which allows building models to get rapidly examine information and convey results quicker. with the use of machine learning technology doctors can make good decision for patient diagnoses and treatment options, which prompts improvement of patient medical care administrations. Machine Learning technology gives a decent platform in medical field, so that a healthcare issue can be tackled proficiently. The fundamental target of our project is to make the user Interface as a part of front end and connect it with ml models using Django python web framework. We will predict the disease in 2 variants i.e., in general and for specific disease. There is a need to study and make a framework which will make it simple for an end user to anticipate the constant sicknesses without visiting a specialist or a doctor for the treatment and also predicts the type of doctors they should visit. Machine Learning has great power to analyse and cope up with different diseases so that prediction is more accurate and it is cost effective in the treatment Computers give us information; they engage us and help us in a lot of manners. A Chatbot is a program intended to counterfeit smart communication on a text or speech. Yet, this paper concentrates only on text. These systems can learn themselves and restore their knowledge using human assistance or using web resources. This application is incredibly fundamental since knowledge is stored in advance. The system application uses the question-and-answer protocol in the form of a chatbot to answer user queries. This system is developed to reduce the healthcare cost and time of the users, as it is not possible for the users to visit the doctors or experts when immediately needed. The response to the question will be replied based on the user query and knowledge base. The significant keywords are fetched from the sentence and answer to those sentences. If the match is discovered or the significant, answer will be given or similar answers will be displayed.

Objective-Develop a web application with integration of machine learning techniques with a patient friendly process to predict disease based on user symptoms. Patients can view predicted results and use chat bot to get information about disease related queries which works on NLP technique. Patients can view available doctors and book appointment and get medical aid. Objective is to design this entire process in a single application to help patients to track disease, book appointment and get information from chatbot. Motivation-In present scenario machine learning is a fast- growing method to help users in short time period. Medical filed is the most researched area in machine learning for predicting various disease and help patients to know about disease based in symptoms. Taking this as main motivation web application is developed to help patients to get all information about disease tracking, chat bot suggestion andappointment booking from single website.

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II. LITERATURE SURVEY

We have reviewed five papers from different other sources to make this project. We studied the relationship between different algorithms and their performance in different scenarios for the prediction of disease.[1] Aim of this paper is to improve the savvy treatment using Machine Learning technology to simplify the decision support system. It is a comprehensive paper on the diagnosis of heart disease by monitoring a person's heartbeat. The framework grants you to set the requirements of your pulse. Subsequent to setting these limits an individual can begin to screen the heartbeat and at whatever point a person's heartbeat outperforms a particular level he get an admonition of high pulse and the danger of coronary failure or the heart attack. Author Ahmed M. Alaa and Senthil Kumar Mohan have experimented with a combination of different factors and obtained 88.7% accuracy with a random hybrid forest.[2]This Paper deals with classic supervised binary classification where it is given a number of attributes in the Dataset. The dataset includes Plasma glucose concentration Blood pressure (mm Hg), Body mass index Age (years) etc. A number of elements all with certain features is used to identify people affected by the disease. To tackle the problem, we should investigate the information, do any necessary changes, apply ML algorithm, train a model, check the exhibition of the prepared model and repeat with different algorithms until we locate the most exact outcome. The improvement of software or sites it is critical to recognize the framework necessities by appropriately gathering expected information to connect with provider and customer.[3]This Paper clarifies that there is a need to study and make a framework which will make it simple for an end-user to anticipate the perpetual disease without visiting a doctor or specialist for diagnosis. It is useful and simple to identify the Various Diseases through looking at Symptoms of patient's utilizing different strategies of Machine Learning Models. This section of the paper results the accuracy using different algorithms such as Decision Tree (DT) with accuracy of 90.2%, Random Forest (RF) with accuracy of 95.28% and NB with accuracy of 88.08%. This Paper clarifies that innovation has been further developed in wellbeing industry to give answers for the patients by giving ideas of trained professionals and facilities where to concede and which expert ought to be counselled for the particular disease. The medical care industry gathers information from the patient's data set by applying information mining and Machine Learning This Paper provided a heart disease prognosis using supervised Learning algorithms. The algorithms used include SVM, KNN and Naïve Bayes. Also, data set contain 3000 objects with 14 features. From the huge writing looked into, it was seen that the maximum research utilized the disease dataset, which contains just 303 objects with14 features. Naive Bayes shows the best results as it takes less time and high Accuracy of 86.6 while Decision Tree gives accuracy of 78.69% and KNN with the accuracy of 77.85%.

III. OVERVIEW OF THESYSTEM

A. *Existing System*

Compared with several typical prediction algorithms, the prediction accuracy of our proposed algorithm 70 percent Disadvantages of Existing System In the proposed system, washable smart clothing, which consists of sensors, electrodes, and wires, is the critical component to collect users' physiological data and receive the analysis results of users' health and emotional status.

B. *Proposed System*

With big data growth in biomedical and healthcare communities, accurate analysis of medical data benefits early disease detection, patient care, and community services. However, the analysis accuracy is reduced when the quality of medical data is incomplete. Moreover, different regions exhibit unique characteristics of certain regional diseases, which may weaken the prediction of disease outbreaks. In this project, we streamline machine learning algorithms for effective prediction of chronic disease outbreak in disease-frequent communities. We experiment the modified prediction models over real-life hospital data collected from different parts of county in 2013-2015. In this project we use three type so medical services to users using our web application which is developed in flask framework usingpython programming language and MySQL database.

C. *Proposed System Design*

In this project work, I used five modules and each module has own functions, such as:

1) *Chatbot Service:* Using this service user will register with web application and have option to use chat bot to get automatic response from trained question and answers data which is done using NLP technique.
2) *Online Doctor Service:* Using this service user can book doctors based on predicted disease using machine learning algorithm based on given input symptoms. Userscan book doctors slots based on timings and get conformation from doctor.
3) *Online medicine booking Service:* Using this service user will have option to purchase medicines from online store and add products to cart and do payment. This application helps users to get all type of medical services in emergency situation and get response based on trained data without any doctor consolation.

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IV. ARCHITECTURE

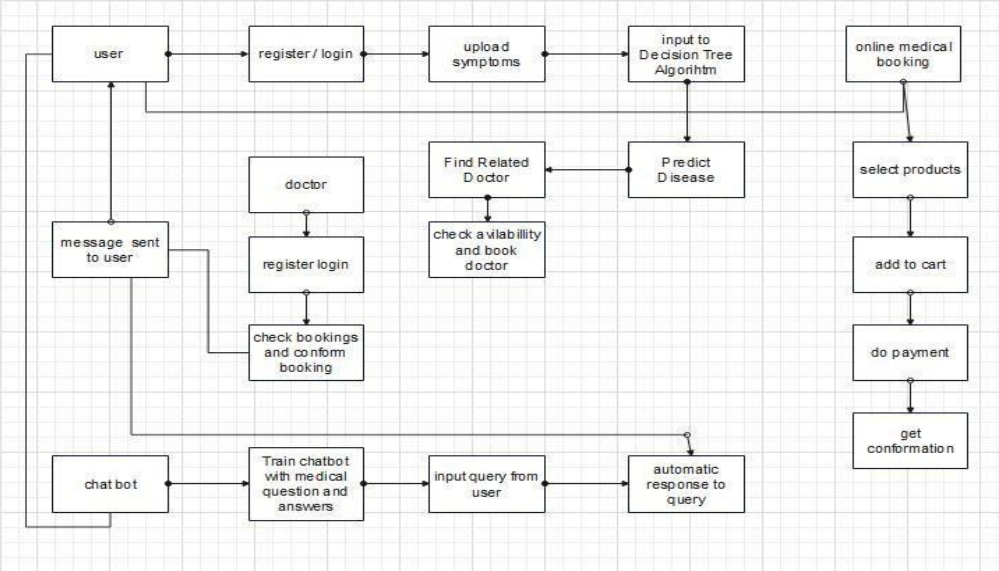


Fig 1: Work Flow Diagram

V. RESULTS ANALYSIS

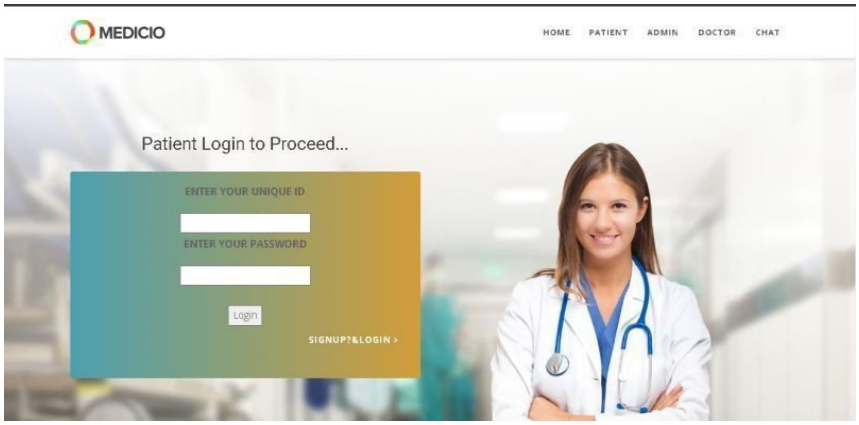
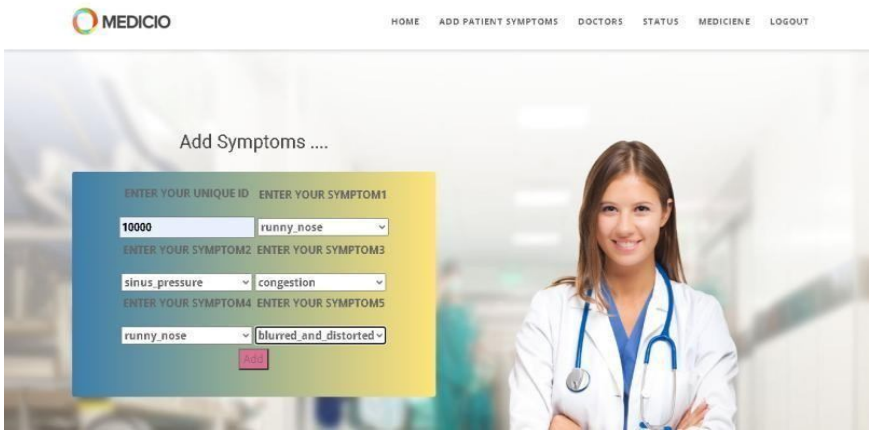


Fig 2.Home Page



. Fig 3 Add Disease

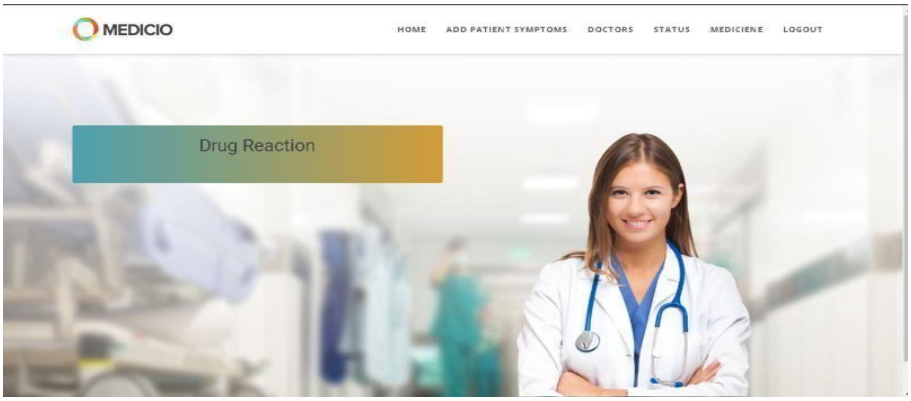


Fig 4.Disease Predicted

VI. CONCLUSION

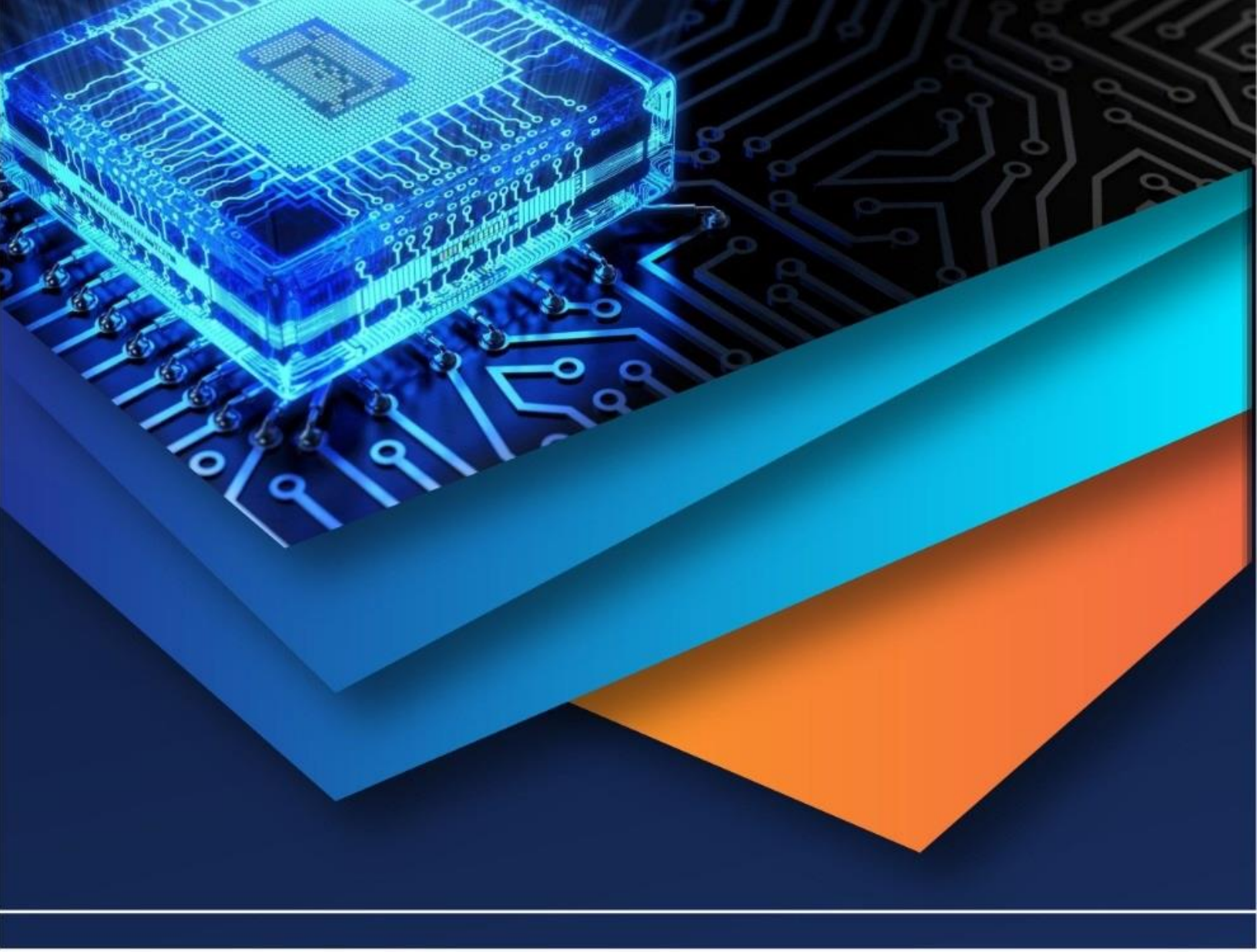
In this application machine learning based medical helper application is developed by testing disease dataset with multiple machine learning algorithms and most accurate algorithm is used to predict disease which is used in flask web framework. Using this frame work health website is designed which has doctor appointment booking, chat bot helper, medicine booking, disease prediction all health-related services are integrated in single application.

VII. FUTURE WORK

In future disease data fordifferent disease are collected and trainedusing Deep learning methods to get moreeffective results and accuracy. Segmentationof MRI scans can be applied to dataset can be integrated to website.

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