

Medicine Recommendation System Using Machine Learning

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Abstract—This Paper present Medicine Recommendation System that leverages machine learning algorithm like Content-based filtering and K-nearest neighbour and support vector machine (SVM). The main aim is to develop a medicine recommendation system that takes patients medical data and symptom and suggest accurate medicine to the patient. In this system we use many machines learning technique and algorithm such as random forest and support vector machine is order to make the system efficient. The system is train over hundred number of patient data. As we talk about the system development programming skill so we develop system using Python with tools like Scikit-learn and Tensor Flow. Along with this HTML and CSS technology were also used to make the interface by which user can interact easily and feed symptom to the system for their outcome. Along with the medicine the system also suggests Precaution alert, workout, Diet plan etc... In future we will also like to add more feature like feedback option so that the user or patient can suggest more improvement to the system.

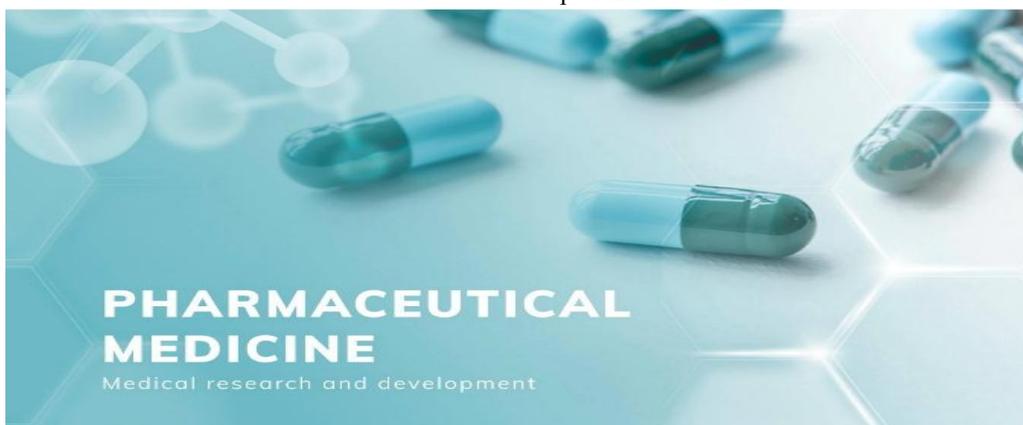
Keywords—Personalized recommendation system, medicine prediction, diet suggestion, Precaution alert, workout plan suggestion

I. INTRODUCTION

In HealthCare Industry, one of the most challenge task is to provide medication timely and accurately. The traditional prescribing methods need professional doctor that rely on their experience, which can lead to delayed and error in treatment that effect on the patient outcome

Many Existing System works on bulk of data means the system rely heavily on generic treatment (i.e., not paying attention on specific patient) so this can be a disadvantage of existing system. this research aims to address this gap by developing a system based on machine learning that will assist individual patient by taking his/her medical history, symptom and many more and recommend medication accordingly. This system also helps in providing fast and accurate treatment that led to consume less time and also help doctor and medical professional in decision making and reduce medical error.

In the system we are using python with python tools like scikit-learn and tensor flow, for Frontend we use HTML and for styling we use CSS through which patient/user can interact.



II. LITERATURE REVIEW

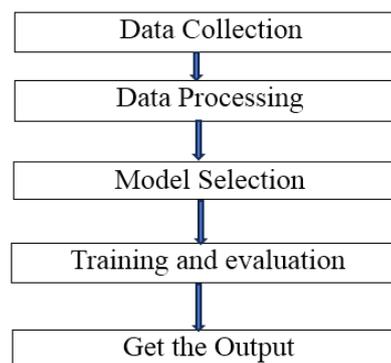
In today's world AI and Machine learning algorithm play a crucial role almost in every field specially in medical field. Many equipment and resources are

there that help doctors and medical professional in taking decisions. In Medicine Recommendation System machine learning help to recommend medicine to the patient to provide personalised treatment.

Title Name	Date of Publish	Technology Used	Type Of Disease	Future Scope	Finding	Limitation
Medicine recommendation system using machine learning	Dec - 2024	Html, CSS, jQuery, python framework and support vector machine	Common disease	Introduce Ai for predicting genetic problem	Their finding is that their advance machine learning algorithms achieve 85% accuracy.	Can't be used for critical disease like cancer etc.
Survey – Machine Learning for Medicine Recommendation system	2 feb- 2024	Support vector machine, neural community algorithm, ID3 decision tree	Fever, Cough, Normal injuries	Advance machine learning algorithms for better analysis	Their study finding offer valuable insight into the ability of machine learning algorithm in the medicine recommendation system	Basic machine learning approach
A computer-based Disease Prediction and Medicine Recommendation system using Machine Learning Approach	March - 2021	Decision tree, Random Forest and Naïve Bayes algorithms	Swine flu, Paralysis migraine, diabetes	Develop new Medicine that is effective by combination of recommended medicine	High accuracy by naïve bayes	Small sample size

III. PROPOSED METHODOLOGY

The main objective of our research paper is to create a web application that recommend medicine based on user input such as their symptoms. And predict an appropriate medicine for them: Here how It will work first we will define the main objective of our system then later on we come to next point i.e., data collection, in this section we gather medical data like symptoms and their respective disease and then the medicine that will cure patient. The dataset is taken from Kaggle open-source platform and make sure that data is complete and correct. The next task is Data Processing, in this section the data is clean and encoded the data. The next is Model Selection, use an appropriate classifier for better recommendation and for better accuracy. The next task is Training and Evaluation, in this the dataset is split and and check the accuracy using metrics like F1-score etc.



1. Data Collection

In this research paper, data was collected from different medical resources to develop an effective medical recommendation system. The dataset includes patient data, such as symptoms, diagnosis, prescribed medicine and personal information such as their age, gender, etc To ensure data quality, data processing step is used to check missing values, and handle them, data normalization and label encoding were applied. The final dataset consists of [132] symptoms with [41] disease for multiclassification. The overall dataset is complete and appropriate for

real-time diagnosis which is crucial for training a machine learning model to recommend correct medicine.

2. Data Processing

After data collection, data processing was applied to prepare the dataset for machine learning model training. In which first the data will be cleaned which helps to remove duplicate or irrelevant entries by either filling them with appropriate defaults or either excluding incomplete records. And encoding the dataset from string to integer, categorical datasets such as symptoms, disease, medicine were in the string format which is converted to integer using label encoding and numerical data such as age, were normalized which helps to improve accuracy and functionality. Then the dataset was split for training and testing purposes. This processing ensures the structured data for machine learning algorithms to predict disease easily and efficiently.

3. Model Selection

For this research paper, four machine learning models or classifiers are used: support vector classifier (SVM), Random Forest classifier (RF) and Gradient boosting classifier and naïve bayes model that help to predict and recommend medicine effectively. These models were chosen for their high

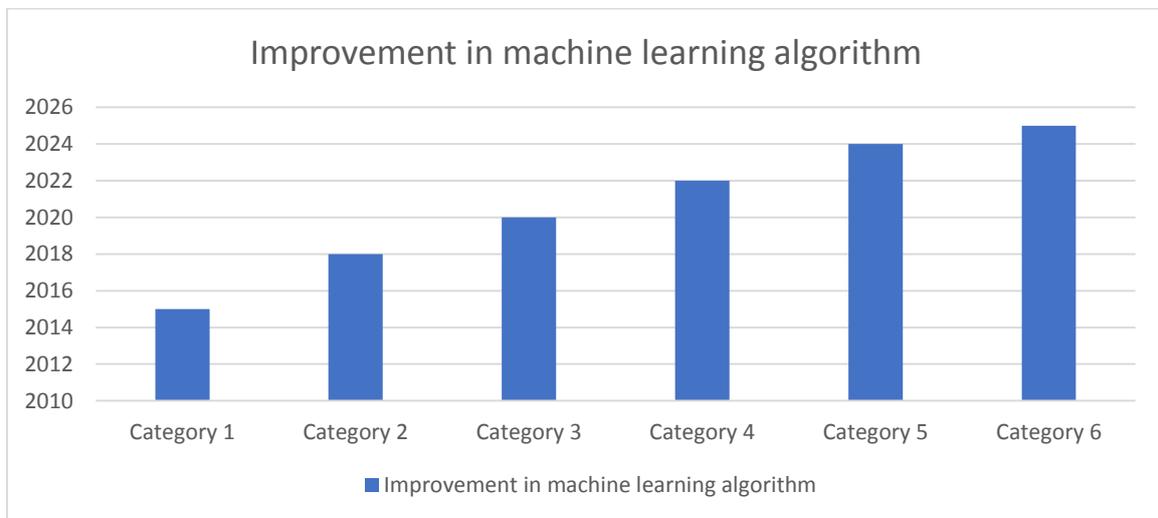
performance in classification tasks and handle structured and categorical data. Support vector classification was chosen for its clear decision ability. Random forest was chosen for its robustness and help from overfitting. Gradient boosting helps in prediction with high accuracy by iterative learning. Naïve Bayes was used due to its speed and effectiveness with categorical input. All the models were trained on the same dataset and later evaluated to provide appropriate results.

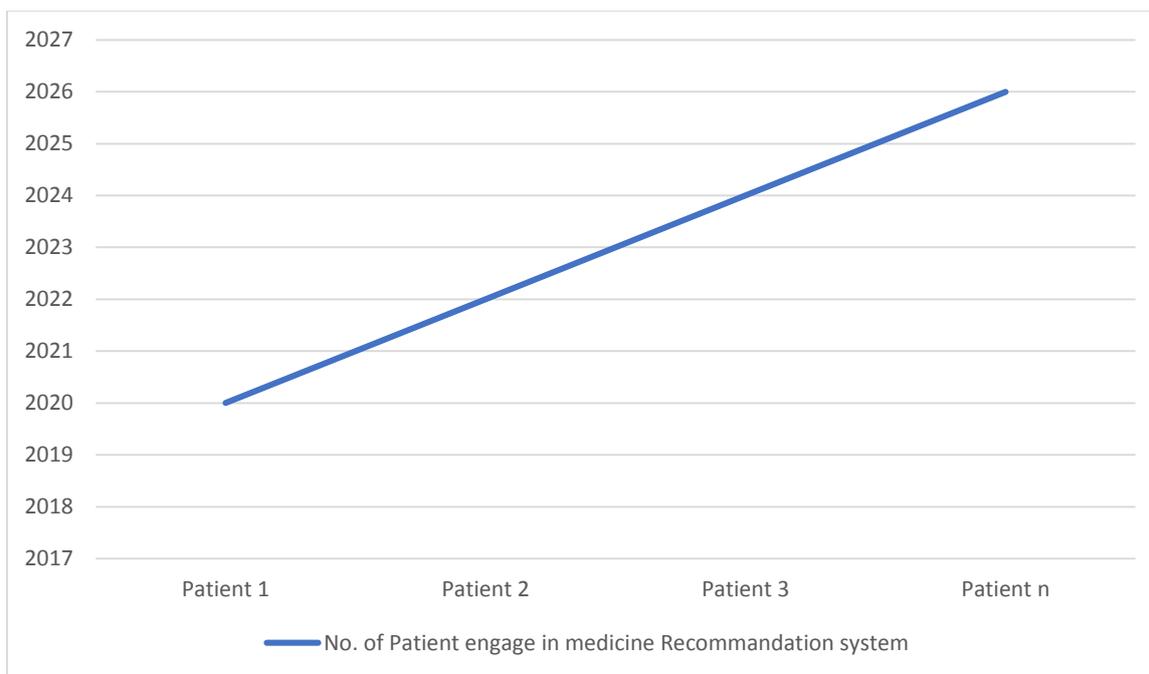
4. Training and Evaluation

In this research paper, the dataset is trained to ensure a better evaluation of the selected model. Each model: support vector classification, random forest classification and naïve Bayes and gradient boosting.

IV. RESULT

After training and testing and evaluation of all four models, it is shown that naïve Bayes is fast and simple and showed lower performance due to independence assumption. Overall result is that random forest classifier and gradient boosting classifier is suitable for the medicine recommendation system due to their ability to handle complex datasets to predict medicine according to the data fed by the system through user/patients.

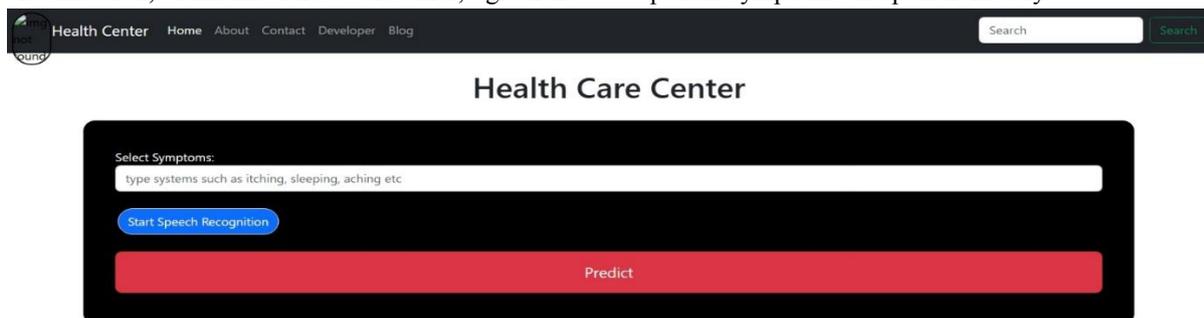




V. CONCLUSION

In this research paper, we are making a medicine recommendation system using machine learning algorithm and model like support vector classification, random forest classifier, gradient

boosting classification and naïve bayes all these algorithms are best for prediction medicine but random forest and gradient boosting model are best for handle categorical data. our finding highlights the personalized medicine recommendation based on patient symptoms and patient history



VI. FUTURE SCOPE

In the future scope, the system has a different corner for doctor consultant, i.e., if any patient has any problem, then he/ she can consult to a doctor to get the solution for their problem. There must be a payment system for this work.

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