

Home Therapist

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Abstract : The current scenario caused by the pandemic COVID has still restricted its boundaries for the huge population of our nation to continue its schedule from indoors as much as possible. The advancement of information technology has been rising continuously despite of the abridge of work from home, sector of education and similarly other services that provided at the doorstep itself currently that reduces the spread of the virus. Technology has fostered many door-based services related to ecommerce or food deliveries. But when it comes to health sector this condition falls short since the doctor has to understand the symptoms and other issues for the further treatment.

This pandemic has shifted most of the real world services towards virtual platforms like teaching, jobs, etc.. It hasn't been as safe to go to the hospitals as before and thus check-ups and interactions have reduced in large numbers. This ignited the ideation of providing the services from the home using the machine learning and other technologies to get the treatment done by providing the solutions into this medical domain.

Keywords : Machine Learning, Natural Language Processing, Naive Bayes, Random Forests, Decision Trees, PyQt5, Tkinter.

1. INTRODUCTION

The idea Home Therapist is basically the homely remedy for the common diseases incurred by every individual in daily life. The project model is AI based and it deploys the task similar to that of the virtual assistant but supports advanced query detection to solve medical quizzing virtually. The project is developed using Python in hand with the various technologies like the machine learning that support the system to enhance the features as an AI based model.

The application would ask the user to mention its symptoms and other health issues faced by him. As per the user's symptoms the remedies are given as in the form of some general home medications or by pills and prescriptions. This would thus, ease to cure common health issues that can be cured easily. The Therapist is a virtual advanced level voice assistant only featuring assistance for medical problems. It is a friendly medical assistant to talk to the users while it is providing cure to health issues related to physical or mental health that can be done without the need of the doctor from the predictions. The model also works on stress and improving emotional quality of the users. Emotions are analyzed using the functions created that tells the user his emotional and sentiment conditions to boost the mood. Besides the mental and physical health issues the project also focuses on first aid which helps to get the cure and remedies known to the user as early as possible.

The dataset is developed after the complete analysis and survey of the people to predict the best results. The Predictor that is part of the system is unique due to its features that tells the user for the type of the specialist that must be visited and the seriousness of the problem and need to visit the doctor for the particular check-up. Since apart from the prediction the Home Therapist also provides the users the severity and the need to consult the doctor that stays a key feature to this project.

The next part of the paper is structured as section II the literature survey carried on and the related works done for the project, section III the proposed system and methodology as section IV, later section V as the results and finally section VI as the conclusion with the future scope.

2. RELATED WORKS

The [1] describes the project as a medical assistant to the doctors and performs the tasks of scheduling the patients with priority taking their data related to the health issues required to display the doctor while examining the patient.

This would reduce time of appointment and other scheduling processes thus the doctor gets additional time for treating extra patients in less time. This is an efficient method and is developed using NLP and ML and project is divided into stages which include the patient registration module and dashboard, patient data module, doctor dashboard, symptom extraction and prescription provision. The overall data of the patient is also stored at the backend and each time the patient visits the doctor after the medication the user receives an email regarding the details. Some methods that involved in the development of project are use tokenization a function that splits the words, post tagging, etc..

The [2] author the use of Artificial Intelligence in Healthcare Chatbot System in which the chatbot system makes a decision based on the patient's request. It uses its own database and in case if the information is not available in the database, the system collects information from search engines like Google and provides it to the user in audio format. The technology and approach used is well highlighted by the author. Google conversation platforms, Google Dialog Flow were the API's used this made sure that the system had maximum adaptability and portability.

In [3] Data set was created through survey of 400 teens later uploaded online besides, the paper performed the analysis of model after implementing with all ML algorithms. The next part discusses validation that gave logistic regression as best method following SVM. The paper focuses its significant contribution by the use of PyTorch and real-time face recognition to generate the best results also endured that the system could not be faked.

In [4] the author explains the applications of the algorithms and discusses them deeply to ensure that the machine learning algorithms are clearly imbibed by the readers. The algorithms covered into this paper are the Support Vector Machine Gradient Descent, Logistic Regression, Support Vector Machine, K Nearest Neighbour, Decision Tree, Back Propagation Algorithm, Bayesian Learning, Naïve Bayes. The paper is limited for study purpose and helps to understand the approach and the set of algorithms that best suits the project the developer wants to work upon.

3. PROPOSED SYSTEM

The model will be similar to the doctor's behavior and work even similarly by question and answer method. Queries are fetched from the user in the form of voice which in turn gets converted to text and will be the input for processing results. The scripts are done in python along with the modules for development of the Home Therapist. The system will be able to predict the diseases with a good accuracy.

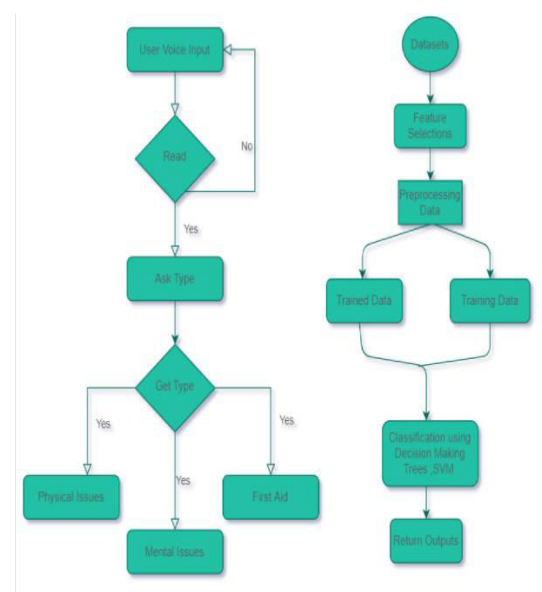
Further it will make use of the Random Forest, Naive Bayes, Decision Tree classifier, etc. algorithms for the implementation.

The system process consists of major 3 modules, the physical, mental and assistant sections which are supported by other minor modules to make transitions from one place to module to another using the buttons.

The assistant makes use of the pytsx3, voice recognition libraries to speak and take the commands from the user and the assistant is developed using the buttons that function to check for that particular domain and provide the solutions. The assistant is similar to the other voice assistant applications just focusing on medical domain.

The predictor is another important module and works for the prediction of the disease and the need of the consultation and the type of the specialist he must visit to. The predictor makes use of the decision tree algorithms for predicting the consultation, random forests for the disease and the naive bayes that works on the principle of probability prediction for the type of the specialist.

The following diagram below is the reference flowchart of the system process to understand its working with the different modules.



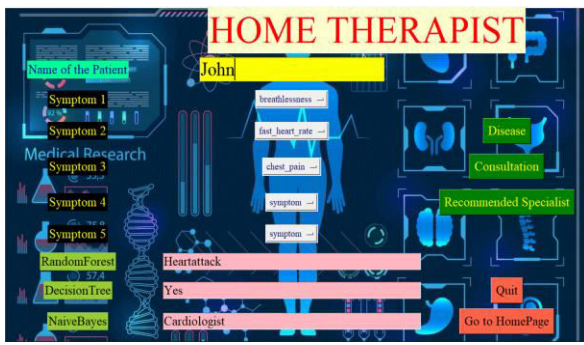


Fig 3: The Predictor – (Output)

The Fig 3 displays the predictor that uses the symptoms then later predicts the disease by using the Random Forests, while based on the disease and severity the Consultation requirement is displayed to the user with the Decision Tree algorithm and lastly the specialist to be consulted using the Naïve Bayes.

The accuracy of the system was around 93.46% considering all the algorithms and individually the decision tree had the highest accuracy over 95%.

4. CONCLUSION

The Home Therapist was built using the ML,AI,NLP and other technologies that made this project a unique in ideation . All the existing systems only provide the prediction of the diseases taking the input from the user in form of symptoms. The need of going to the hospitals is reduced since the people could get treated at home which significantly reduced the risk of getting infected as hospitals were the prime center .

The system could give a good accuracy and the prediction was implemented using 3 different algorithms for the purpose of disease , consultation, specialist respectively. The user inputs were easily executed after testing over multiple cases and the project was over all able to help the users in initial medical stages and cure them providing the solutions. Sleeping and mental emotions were improved using the mood booster.

FUTURE SCOPE

Creating a database for storing the user values would be the primary task to begin for future enhancements. Moreover the development of the medical assistant to communicate multilingually so that there is no barrier of language between the user and the system.

Besides the project can further be developed on working with real-time detections this would even capture the mental emotions and store it into the database.

The current project is software for the local machines the next enhancements can be done to make a Web application and host it onto the internet . This will provide a good way to create and work with the database of the system. Furthermore the user's login, dashboard and other database can be additional enhancements.

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