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HOSPITAL MANAGEMENT SYSTEM WITH CHATBOT (DEEP LEARNING WITH AI AND RNN)

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ABSTRACT

In this project you ask us to develop Chatbot which can analyse input symptoms and then predict disease and then display diet and doctor appointment booking. It's not real time application to make booking with the doctor but we will display predicted disease, diet information along with doctor and hospital details.

To identify disease we need to train Chatbot with machine learning so it can take symptoms as input and then predict disease and to train Chatbot we have use CNN algorithm.

1.INTRODUCTION

A prosperous society is when its entire people are healthy. It is important to maintain the health if one wishes to be happy. Only a healthy body can have a healthy mind and it has a positive impact on the performance of people. Nowadays, people are less aware of their health. In their

busy life, they forget to take suitable measures to maintain their health and are less aware of their health status. In the latest news by TOI [1], we can see that people give no importance to their health and find it time consuming to undergo check-ups at hospitals. The busy-scheduled life has got no place for health. Most people comprising the working section of the society claim that their hectic schedule gives them no time for periodic medical check-ups and that they disregard any uneasiness shown by their body until it is too severe.

2. LITERATURE SURVEY

In the research paper titled "HEALTH ASSISTANT BOT: A PERSONAL HEALTH ASSISTANT FOR THE ITALIAN LANGUAGE" by Marco Polignano, F. Narducci, Andrea Iovine, Cataldo Musto, Marco De Gemmis, Giovanni Semmeraro (2020), proposed a system to create a Telegram bot assists sufferers by

recognizing the patient's situation, locating the right surgeon to aid in the supervision of medication and health metrics and raising the patient's awareness of pertinent symptoms and ailments.

The techniques used are Natural Language Processing, Machine Learning (Random Forest, Naive Bayes, Logistic Regression and Multilayer Perceptron) and PostgreSQL database.[1]. In the research paper titled "HEALTHCARE CHATBOT SYSTEM" by Nidhi D. Rathi, Dr.A.Deorankar (2022), proposed a system to create a healthcare chatbot using Artificial Intelligence that could evaluate the disease and provide critical information about the sickness before seeing a professional. The techniques used are Natural Language Processing, Deep Learning (Convolution Neural Network) and MySQL database.

The conclusion includes providing smart solutions like chatbots which meet the business needs of the organization. [2]. In the research paper titled "HEALTH CHATBOT USING NATURAL LANGUAGE PROCESSING FOR DISEASE PREDICTION AND TREATMENT" by Philip Indra Prayitno, Reinhart Perbowo Pujo Leksono, Fernando Chai, Richard Aldy, Widodo Budiharto

(2021) proposed a system to use NLP to create a chatbot system which can interpret as well as respond to the recipient's inquiries. The techniques used are Natural Language Processing, Machine Learning (Cosine Similarity, ID3 decision tree algorithm). The limitations include enhancing the chatbot's accuracy, add additional features such as purchasing medicines from the application, suggesting hospital within user's vicinity.

The conclusion states that the bot is resulting an accuracy being 87.5% whether the user has idea about the disease or not. [3]. In the research paper titled "MEDBOT: A CHATBOT FOR DETERMINING THE PROBABLE DISEASES BASED ON THE USER'S SYMPTOMS" by Karan Gori, Yasir Ahmed, Shubham Chikane, Amrita Mathur (2021) proposed a system to ask a user to input descriptive symptoms that he or she is encountering and the bot would return the ailments that are the closest match. The techniques used are Named Entity Recognition (NER), Support Vector Machine (SVM) algorithm.

The limitation includes improving the NER model for better accuracy. The conclusion states that the project may be improved by incorporating features like video calls with

doctors and linking this tool with neighbouring health facilities. [4]. In the research paper titled “CHATBOT FOR DISEASE PREDICTION AND TREATMENT RECOMMENDATION” by Rohit Binu Mathew, Sera Elsa Joy, Swanthana Susan Alex, Sandra Varghese (2019) proposed a system to serve as a conversational agent that encourages individuals to talk about various medical problems depending upon the symptoms they present and provide diagnosis.

The technique used is Machine Learning (K-nearest neighbour algorithm). The limitations include setting up an appointment with a doctor, automatic report generation of the user so that it can be forwarded to doctor, a video call with an expert professional. The conclusion states that the intelligent health chatbot can help patients by recognising their symptoms, making a thorough assessment and delivering appropriate therapy for the ailment. [5].

In the research paper titled “A GRAPH BASED CHATBOT FOR CANCER PATIENTS” by Belfin R V, Shobana A J, Megha Manilal, Ashly Ann Mathew, Blessy Babu (2019) proposed a system to create a cancer chatbot built specifically for those

battling with cancer where patients may inquire about cancer symptoms, therapies, longevity and so forth. The techniques used are Natural Language Processing, Web Scraping, Neo4j. The limitations include enhancement of the database by adding more data, recognition of the images sent by the user, inclusion of voice recognition, sentiment analysis of the patient. The conclusion states that unlike previous chatbots that focused on areas other than cancer, the said chatbot entirely focused on cancer. Patients could acquire cancer-related knowledge by participating in an interaction with just this cancer bot. [6]

3. EXISTING SYSTEM

The existing system is based upon the research paper titled “Health Assistant Bot: A Personal Health Assistant for the Italian Language” by Marco Polignano. The author implemented a virtual assistant that has the following features:

- Interact with users(patients), develop and maintain [1] conversation with them and extract information
- Comprehend the symptoms specified by [1] the user

- Uses machine learning methods to analyze user complaints and identify illnesses [1] automatically

- Aid in the monitoring of [1] therapies and aspects of health

- The features were divided into these modules: Profiler, Symptom Checker, Knowledge Base, Gateway and Recommender System [1]

- Profiler:

- Maintains patient's profile and records clinical data, such as gender, age, name, medication, and health factors by using a

PostgreSQL database

- The module saves user demographic information, medication, and monitoring data.

- ensures that user profile data is created, read, updated, and deleted if required

- Symptom Checker: Determines the disease and clinical area based on the symptoms provided by the user

- Knowledge Base: offers information on illnesses and symptoms and allows users to reference more detailed information about them

- Recommender System: The Symptom Checker and Knowledge Base will be used by the Recommender System to generate a list of doctors who can treat the patients

- Gateway:

- redirects user requests to the appropriate server-side functionality

- built as a RESTful web service that provides high-level APIs for the client to communicate with the chatbot's multiple capabilities

- distributed on the Heroku cloud platform which provides free HTTPS access via SSL certificates

- Telegram is the Dialog User Interface for the Health Assistant Bot (HAB)

- Six major functions in the interface:

- Doctor suggestion: The system will prompt the user to write a text message describing the symptoms and to choose one of the clinical categories automatically selected by the system. Following that, the user can enter location. Ultimately, the user will acquire a list of surrounding doctors who can provide treatment.

- Symptom evaluation: the patient specifies symptoms and the system responds by recommending an illness that matches the

symptoms by including a description of the disease, the prediction's confidence level and a link to Wikipedia with further information about the ailment.

□ Medical vocabulary: The user can enter a medical word to acquire further information on it. The bot answers with a brief summary and a link to Wikipedia

□ Treatment Management: It is concerned with the storage and handling of the user's numerous medical treatments

□ Monitoring: permits the user to save health status received by scanning a clinical assessment report

3.1 PROPOSED SYSTEM

The primary objective of the proposed system is to resolve the problem of the existing system. The proposed system is as follows:

Features:

•Collects symptoms from the user as input:

This involves Natural Language Understanding and Natural Language Processing in which the input/query specified by the user is to be made understood by the Chatbot. This involves implementing the following steps:

□ Tokenization: The process of converting a sequence or text into a set of tokens. For this, use nltk punkt tokenizer separates a sentence into something like a list of lines by creating a representation for abbreviated words, colloquial expressions, and phrases that start sentences by the usage of an unsupervised method. Before it is deployed, it has to be trained on an extensive corpus of data in the chosen language. Tokenize each pattern in our dataset (the file which consists of the intents, patterns, tags and responses) and add to list of tokenize patterns and their corresponding labels.

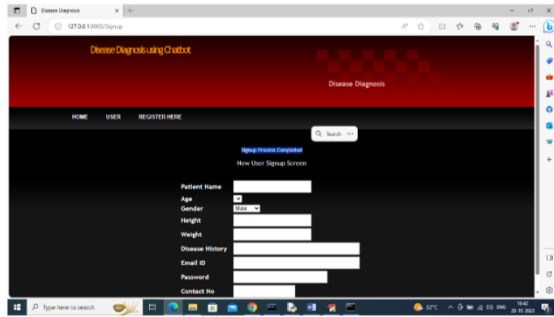
□ Convert to lowercase: Due to the program's case sensitivity, all created tokens are transformed to equivalent case. Or else, it will treat the same phrases in various circumstances as distinct terms.

□ Stemming: The process of eliminating a portion of a word or lowering a phrase to its root or stem. Lancaster Stemmer is used for stemming the sentences. It is a stemming algorithm based on Paice / Husk algorithm. Here, each word will be reduced to their root word and sort them in the list.

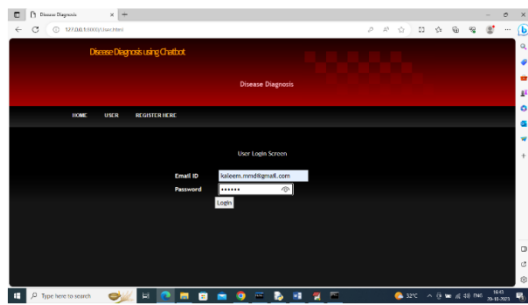
□ Creation of vocabulary matrix: This vector consists of the encoded data of the dataset and assigns zero or one for every word in the bag that is present in the

[illegible]

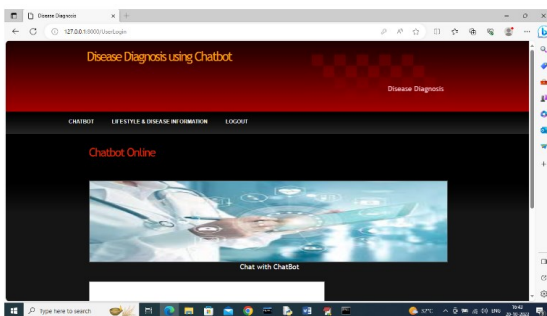
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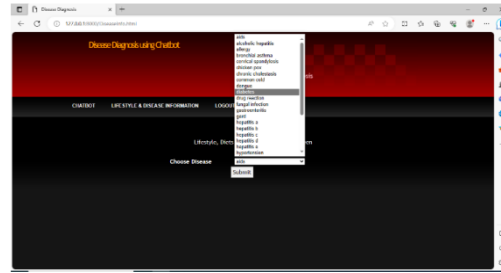
In above screen in blue colour text we can see sign up completed and now click on 'User' link to login as user



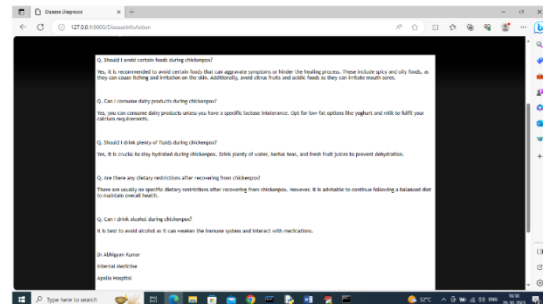
In above screen user is login and after login will get below page



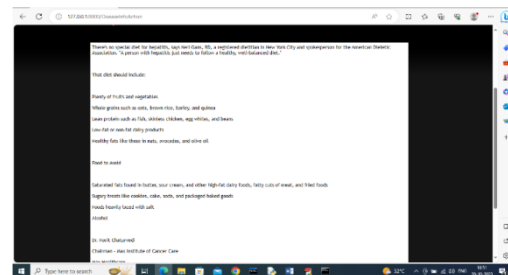
In above screen click on 'Chatbot' link to get below page



In above screen user can select specific disease and then press button to get disease, diet information like below screen



In above screen user can see some answers about selected disease along with doctor details.



In above screen for some disease we can see information about Food to take and avoid

5. CONCLUSION

We have implemented a chatbot related to health care that can perform the following tasks.

- The chatbot application takes user's query as the input and processes the input by using Natural Language processing techniques like tokenization, stemming, bag of words.
- To make the Chatbot efficient, we have adopted the following Machine learning algorithm: Stochastic gradient descent which can identify the disease based on the symptoms specified by the user and suggest food and physical activity to the user.
- We have compared our model with the models implemented by other authors (Naïve Bayes, Logistic Regression, Random Forest, Multilayer Perceptron) and comparatively achieved good accuracy.

The following system is 84.48% accurate and uses SGD algorithm. It takes the symptoms from the user as input and gives the recommended food and physical activity suggestions.

6. FUTURE SCOPE

Further enhancements can be in the following ways:

- Text Classification can be improved to allow users to write the same query in different ways to map to a common response.
- Chatbot can be updated to a Virtual Assistant.
- Inclusion of GPS feature that tracks current location and displays nearby hospitals and clinics.

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