ANN Based Medi Chatbot Prototype

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Abstract

Typically, individuals lack comprehensive knowledge about various treatments and symptoms associated with specific illnesses. When faced with minor health concerns, they often find themselves need to go directly to a hospital for a consult, which can be a lengthy procedure. Moreover, managing phone calls related to health complaints can become burdensome. An effective solution to these challenges can be found in the use of a medical Chatbot, which offers valuable guidance on maintaining a healthy lifestyle and addresses health-related queries, thereby streamlining the healthcare experience for users. Medical chat-bots operate by utilizing neural networks to enable users to present their health-related issues. These users can pose personal health inquiries through the chatbot, eliminating the need of physical hospital visits. Queries are transmitted to the Chatbot, which responds with relevant answers and these responses.

Keywords: Artificial neural networks, Recurrent neural networks, Health care.

Introduction

A chatbot is a piece of software that converses with people via text or voice [11]. While some make use of natural language processing techniques, others just perform a keyword search in the input and return an answer that includes the most relevant terms or patterns found in the data.[5]. Minor diseases could be a quite common problem worldwide. This undertaking is aimed to establish An AI chatbot in action of health care by using several algorithms and delivering it as a web-based user interface that functions as a medical Chatbot. The intended medical Chatbot requests that users describe the symptoms they are experiencing and it will return the diseases that are closest to the user's description. ANN, RNN algorithms are employed with trained data to extract significant aspects of symptoms for the purpose of predicting diseases. A chatbot that poses as a medical assistant can be useful in pandemic situations since technical support that provides some assurance of health is always beneficial. It can assist you get rid of all your worried thoughts and lessen mental exhaustion in remote places where access to physicians and transportation are limited, it might serve as a backup medical resource. According to numerous health advisories, rather than emailing or contacting a live human, many patients will be encouraged in the future to bring up their questions and concerns to a Chatbot in order to receive prompt answers.[1]

Chatbot that have applications in the educational, medical, and travel guidance sectors. The majority of people in today's world are probably internet addicts, but they do not give their personal health any thought. They refrain from going to the hospital for minor ailments that might later turn into serious illnesses. Creating conversations with questions and answers is quickly replacing the difficult task of searching through a list of internet pages that might be helpful. Certain procedures might require a fee for conducting live chat or phone calls with doctors via the internet [3]. This. Technology is becoming more and more common, especially in the business sector, and this automation could reduce the need for labor.
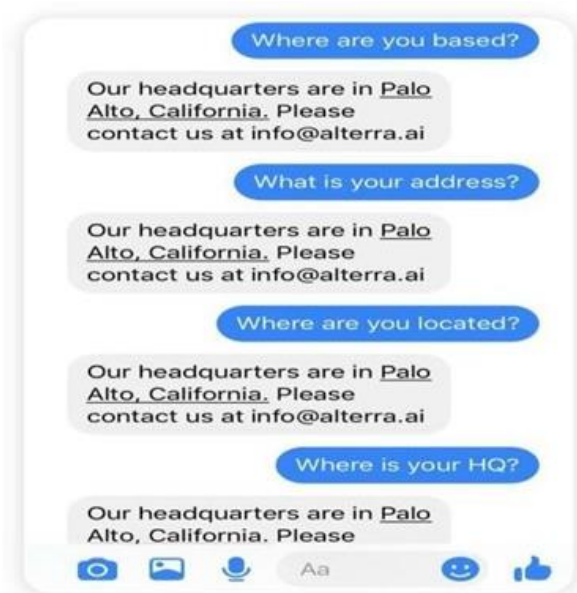

Figure.1. Simple Chatbot template

2. LITERATURE SURVEY:

1) Chatbot for Health Care system using Artificial Intelligence; LekhaAthota, Vinodh Kumar Shukla. This Chatbot is implemented by using Virtual Assistance and TFID and SQL is used for to handle the database. The main motive of this to help the users regarding minor health information. Here the user ask their queries to the bot and bot response with relevant suggestion to the user [2].

2) Intelligent Chatbot for Lab Security and Automation; Akshatha Prasad, R. Ranjith. This Chatbot is implemented by using Automatic speaker recognition system, MFCC, speech to text. This project is main used for allowing only authenticated persons to the lab by recognizing their voices to provide security [11] .

3) Text Messaging-Based Medical Diagnosis Using Natural Language Processing and Fuzzy Logic; Nicholas A.I. Omoregbe, Israel O. Ndaman. Fuzzy logic rules, a fuzzy logic interface, natural language processing, and Telegram Bot application programming interface (API) were utilized in the implementation of this chatbot. The system was connected to the chatbot through this API. [10].

4) Doctor Chatbot -Smart Health Prediction; Seema j, Suman S. Dialog flow, Support Vector Machine (SVM), and data mining are used in this project. The proposed chatbot is meant to be a predictor of heart disease, intended for those who are treating heart-related symptoms of any kind. The bot is trained using information gathered from multiple forums dedicated to heart disease, where members possess extensive and high-quality cardiac knowledge. [5].

5) Diabot: A Predictive Medical Chatbot Using Ensemble Learning; Manish Bali ,

Samahit Mohanty. This chatbot is developed by using ensemble learning , machine learning , Natural language understanding. Using a variety of characteristics, including age, body mass index, glucose, blood pressure, skin thickness, insulin, and diabetes pedigree function, this chatbot is used to predict the condition. [12].

6) A Medical Chatbot ; Rashmi Dharwadkar , Neeta. This chatbot is developed by using NLP , Porter Stemmer ,Google voice API , Word order Similarity between sentences. This system is useful for medical institute to help the users to freely ask medical dosage related queries by voice and can get related answer[3].

7) Artificial Intelligence Healthcare Chatbot System ; Manish , Shubhi Gupta . This chat uses the Artificial intelligence and health care . This chatbot is response with the symptoms related to the few diseases like fever , malaria, jaundice , typhoid on the interface and suggesting their medicine regarding the problem[9].

3. METHODOLOGY:
The primary goal of the provided Chatbot-based medical application is to make the most accurate disease prediction without harming the user's life or causing them any form of inconvenience. We therefore require an algorithm that can complete this task quickly and accurately. As a result, we are predicting diseases using methods based on neural network algorithms.

1. Artificial Neural Network
2. Recurrent Neural Network

Within the framework we have devised, we offering a set of instructions on the illnesses and the indicator that go along with them in our suggested system. In order to assist in prediction and serve as a training data set for the system. Therefore, we are using neural network algorithms for prediction.

An artificial neural network, as used in artificial intelligence research, attempts to mimic the neuronal network that makes up the human brain in order to enable computers to comprehend data and reach conclusions that are similar to those of people. The artificial neural network is built by educating computers to function like networked brain cells.

a) Artificial Neural Network:
Artificial Neural Networks, or ANNs for short, are feed-forward neural networks. Units are artificial neurons found in artificial neural networks. Neurons are fundamental building blocks of ANN. These modules, arranged in several layers, comprise the full artificial neural network within a system. A layer may include any number of neurons, depending on the network model. Those are:

INPUT LAYER: This layer of the neural network receives the initial data.

HIDDEN LAYER: This layer is between input and output layer where network process the information. This layer helps the network learn complex relationships in data.

OUTPUT LAYER: This layer produce the output of the given information.

Weights and biases exist, and there are weights and biases connected to those neuronal connections. During training, these parameters were changed to help the network learn and become more efficient.
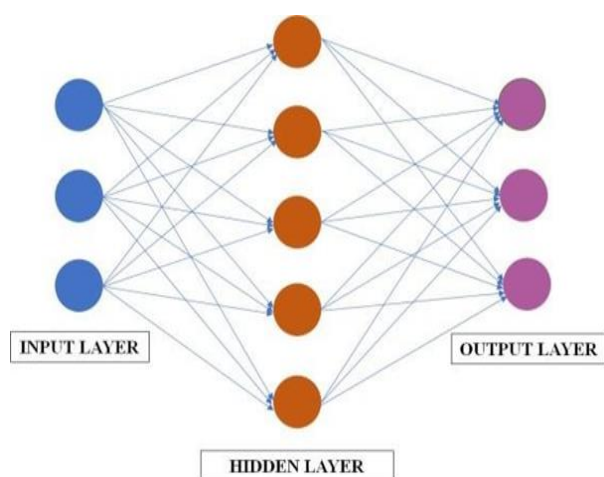

Figure.2.Artficial Neural Network

b) Recurrent Neural Network:

Recurrent neural networks are neural networks in which the output from one phase is used as the input for the subsequent phase. Recurrent neural networks' hidden state saves some information about a sequence and serves as a differentiating feature. Recurrent neural networks employ the same values for each input to produce the same output across all hidden layers. Recurrent neural networks can process sequential data such as audio, text, and time series. Recurrent Neural Networks developed by using back propagation through time, which is a version of the back propagation algorithm. This Neural Networks are exposed to vanishing and expanding gradient problems. Alternative versions with Long Short-Term Memory improve the RNN's capacity for handling long-term dependence. Another kind of neural network that can handle sequential input is a recurrent neural network.
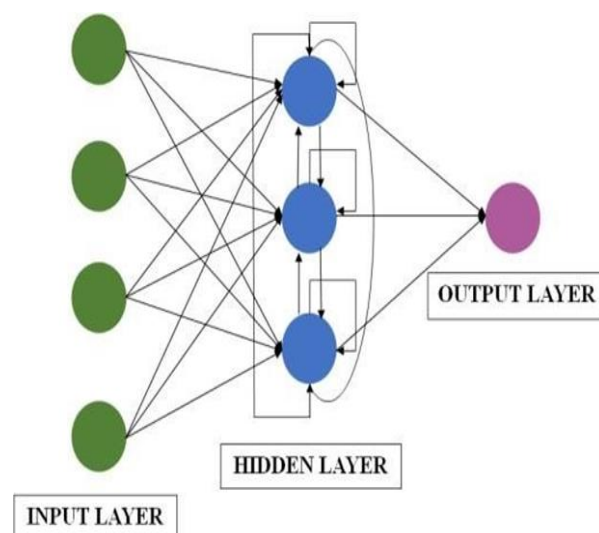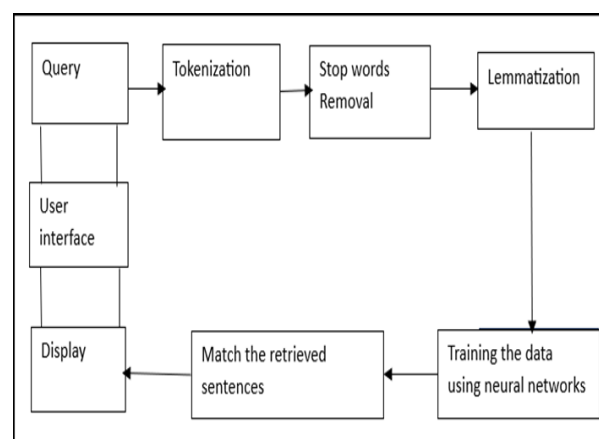

Figure.3. Recurrent Neural Network

Figure.5.Proposed system architecture.

In our suggested Medi care Chatbot, the user first enters a text-based query linked to a health condition. The query is then pre-processed using the natural language tool kit library and trained using neural network algorithms. We have previously given the model advice regarding the symptoms. As a result, it will fetch the corresponding sentences.
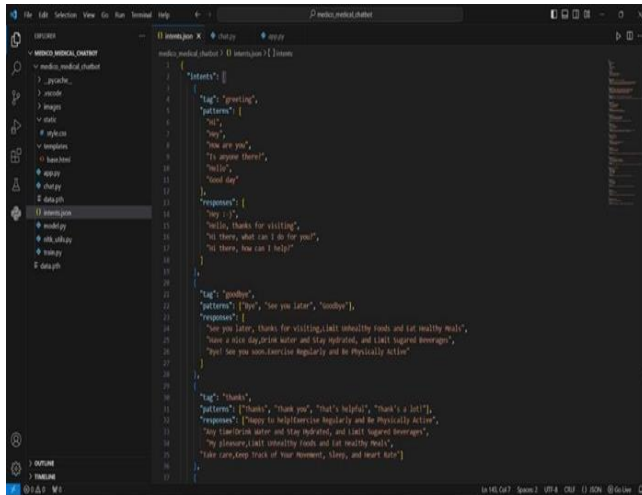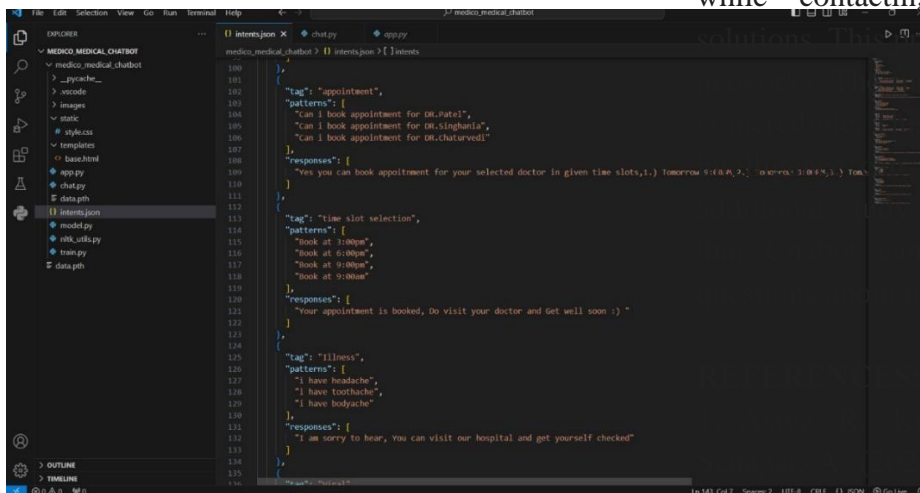
4. RESULT ANALYSIS:

Figure.6 (a).

Figure.6 (b).

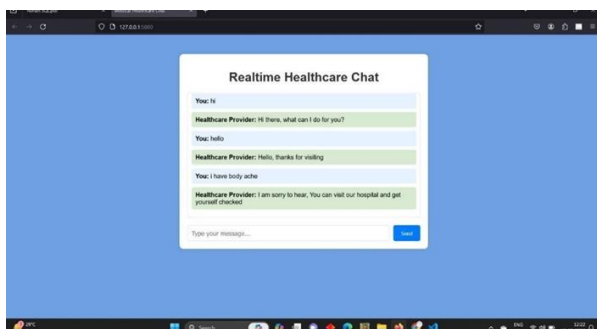In the above figure 6(a) and 6(b),depicts the json file format data which is used for train the Chatbot.

Figure.7.

In the above figure 7, is the sample output for the Chatbot.

5. CONCLUSION:

A Chatbot is a fantastic conversational tool. The program is intended to provide high-quality responses in a short period of time. Based on the symptoms, the Chatbot can give a succinct summary of the condition a person is experiencing.. It frees up the answer provider's time by sending the response straight to the user via an expert system. This project was designed to save the user time while contacting doctors for healthcare solutions. This program was built using neural network. The future potential of this Chatbot is promising. Chabot's inventiveness and capabilities can be enhanced by completing further study and expanding the data so that it can answer a wide range of questions about minor conditions.

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