Chapter 20
Healthcare Conversational Chatbot for Medical Diagnosis

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ABSTRACT

Medical services are basic needs for human life. There are times when consulting a doctor can be difficult. The proposed idea is an AI-based chatbot that will provide assistance to the users regarding their health-based issues. The state of the art in the aforementioned field includes extractive bots that extract the keywords (i.e., symptoms from the user's input) and suggest its diagnosis. The proposed idea will be a conversational bot, which unlike the QnA bot will take into consideration the context of the user's whole conversation and reply accordingly. Thus, along with symptom extraction, the user will get a better experience conversing with the bot. The user can also normally chat with the chatbot for issues like if the user is not emotionally sound. For example, the bot will console the user if he/she is feeling stressed by recognizing the emotional health of the user.

INTRODUCTION

Chatbots are one of the most popular applications of Artificial Intelligence (AI). A chatbot is an AI software that can chat or converse with users in a way another human being would. Chatbots are basically used to simplify user interactions with computers via text or speech. There are many ways through

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which users can chat or converse with chatbots. Some of them are messaging apps, mobile phone apps or websites. Chatbots are one of the most advanced and promising technologies of human to computer interactions. Now how does a chatbot actually work? The answer is - Chatbot must have the ability to understand the intent of the user, extract the data accordingly and provide correct answers to the users. If it does not understand the user's request, it won't be able to give correct answers. AI technologies like Natural Language Processing (NLP) and Machine Learning (ML) are used for teaching the chatbots to read, analyze and interpret human language. These technologies help chatbots in understanding the language and its meaning. Deep Learning (DL) is used to improve chatbot's response to user requests.

There are many applications of chatbots present in the real world. Personal Assistants like Google Assistant, Siri, Alexa are some complex chatbots designed to answer a wide range of user queries like news updates, current weather, personal calendars, random questions. There are chatbots used for customer services as well with a limited scope of queries and responses. Nowadays chatbot applications are rapidly growing in the medical field. Some of the most popular uses of chatbots in the medical field are day-to-day assistance in patient care and wellness, tracking user's physical health, providing food and diet recommendations and for the mental health of patients.

There are many times when consulting a doctor can be difficult. Even Google searching for symptoms can be a headache due to thousands of search results, many contradicting suggestions or misleading sites. At such times, a trained and tested chatbot dealing mainly with such cases is like heaven. There are many chatbots integrated with mobile apps that help patients in scheduling appointments, managing test reports, issuing reminders, providing diet and personalized recommendations. These chatbots are trained based on customized requests of users and their responses are handled by physicians. Thus a chatbot can very well play the role of a health coach. Some of the examples of chatbots in this field are Florence, Your.MD, Safedrugbot, Babylon Health. Thus Chatbots replacing humans in some functions makes the process more efficient, more effective and also cost-saving for patients and healthcare providers.

LITERATURE SURVEY

The medical domain is vast and hence there exist numerous contributions. The concept of healthcare assistants took off with the advancements in chatbots in general. Chatbots possess the potential to deliver medical assistance effectively and efficiently. The concept of chatbots has been broadly classified into 2 major types - Unintelligent Chatbots, that are built to respond to only predefined inputs; and Intelligent Chatbots, which are built on machine learning (Madhu, Jain, Sebastain, Shaji, Ajayakumar, 2017). The rule-based unintelligent chatbots have been in charge for a few years and many leading chatbots were rule-based with smart answering algorithms. (Madhu et al., 2017) defines a system for medical assistance involving a chatbot which is based on an API and the medical assistance based on another API. The chatbot works by extracting the symptoms from the user input and then the medical API generates the diagnosis based on the given input. Here, the symptoms are in JSON format wherein the symptoms and the corresponding diseases are predefined and matching those criteria, the bot suggests the medication to the user. Revisiting the mention of a 'system' for medical assistance, the system also includes user authentication. The main aim is to eliminate the descriptive nature of medical websites. (Rosruen, Samanchuen, 2018) describes the nature of chatbots and how AI-based chatbots help in generating better responses. (Rosruen, Samanchuen, 2018) attempts to create an AI-based chatbot that is trained on Google's