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Medical Assistance Chatbot

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Abstract - *In today's fast world where everyone is running around to get their work done in time a quick medical assistance is need of the hour. Auto-response system or chatbot can be very useful in providing a quick response using a handy device like a mobile phones. The objective of medical assistance can be fulfilled by chatbot technology. The use of mobile phones is also a economical option of getting a medical assistance.*

Key Words: **Natural Language Processing, Artificial Intelligence, Bag of Words, Beam Search Decoder, Recurrent Neural Network.**

1. INTRODUCTION

The recent upgrade in technology and boost in use of various user friendly programming language has increased the importance of machine learning and machine learning is becoming a major factor in helping people of making their life easy. Machine learning is helping developers in creating a machine that can think and work as a human. Using natural language processing a machine is able to decode human text and create a response which is very similar to what a human will respond. Such conversations make's the user comfortable while interacting with the machine and trust the result generated from them.

A chatbot system is a software program that can interact with humans in a way where humans won't feel like they are not talking with a machine rather they will feel like they are having a conversation with a human. For having a conversation with a chatbot the user does not need to have a technical knowledge about the software. The purpose of the chatbot is to decode the text received from the user and to provide them accurate response after performing the computation on the input received.

2. LITERATURE SURVEY & RELATED WORK

Chatbot is implemented based on the information of the symptoms and treatment records gathered from the DoctorMe application developed by using Dialogflow powered by Google's machine learning[1]. Author introduced a novel chatbot application which provide mental healthcare counseling service based on natural language processing and emotion recognition methods in chat assistant platform which consist of the user sensitive emotion and context extraction[2]. In [3] author has Built a simple and interactive real time chat system using AI to predict the diseases based on the symptoms and give the list of available treatments. A novel approach to design and develop a framework for revolutionizing medical kiosk via the incorporation of an intelligent chatbots is discussed in [4]. The system can analyze the IoT data in synchronization with the data entered by the user to give a precise diagnosis to them is explained in [5]. A conversational service for psychiatric counseling that is adapted methodologies to understand counseling contents based on of high-level natural language understanding (NLU) [6], and emotion recognition based on multi-modal approach.

Pharmabot that will act as consultant pharmacist that will give the rational, appropriate and safe medication of generic drugs for children based on the information collected from the user by chatting[7].

In the proposed system [8] the user dialogue is a linear design or the linear structure that proceeds from symptoms extraction to symptoms mapping, where it identifies the corresponding symptom, then diagnosis the patient whether it's a major or minor disease and if it's a major one an appropriate treatment suggestion will be referred to the patient.

2.1.SUMMARY OF LITERATURE SURVEY

1.	2018	Chatbot Utilization for Medical Consultant System	Nudtaporn Rosruen and Taweesak Samanchuen	Chatbot is implemented based on the information of the symptoms and treatment records gathered from the DoctorMe application developed by using Dialogflow powered by Google's machine learning.

3.	2017	A Novel Approach for Medical Assistance or Medical Emergency Using Trained Chatbot	Divya Madhu, Neeraj Jain C. J, Elmy Sebastain, Shinoy Shaji, Anandhu Ajayakumar	Author has Built a simple and interactive real time chat system using AI to predict the diseases based on the symptoms and give the list of available treatments.
4.	2017	MedKiosk: An Embodied Conversational Intelligence via Deep Learning	Pui Huang Leong, Ong Sing Goh, Yogan Jaya Kumar.	In this paper, a novel approach to design and develop a framework for revolutionizing medical kiosk via the incorporation of an intelligent chatbots is discussed
5.	2019	A Research on Machine Learning enabled IoT devices for Medical Assistance	Gauri Tawde, Yash Choksi, Roshan Singh, Krishna Samdani.	The system can analyze the IoT data in synchronization with the data entered by the user to give a precise diagnosis to them.
6.	2017	A Chatbot for Psychiatric Counseling in Mental Healthcare Service Based on Sentence Generation and Emotional Dialogue Analysis	Kyo-Joong Oh, DongKun Lee, ByungSoo Ko, Ho-Jin Choi.	In this work, based on multi-model approach,a conversational service for psychiatric counseling that is adapted methodologies to understand counseling contents based on of Emotion Recognition and high-level Natural Language Understanding (NLU).
7.	2015	Pharmabot (Pharmaceutical Chatbot): A Pediatric Generic Medicine Consultant Chatbot	Benilda Eleonor V. Comendador, Bien Michael B. Francisco, Jefferson S. Medenilla, Sharleen Mae T. Nacion, and Timothy Bryle E. Serac	Pharmabot (Pharmaceutical Chatbot) that will act as consultant pharmacist that will give the rational, appropriate and safe medication of generic drugs for children accordingly based on the information collected from the user by interaction between them.

3. ARCHITECTURE OF CHATBOT WITH NEURAL NETWORK:

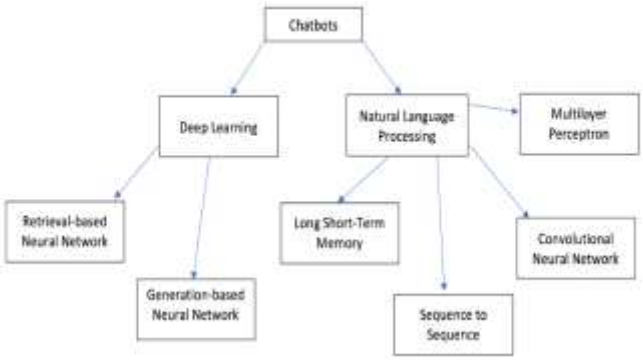

Fig 1:Chatbot with neural network

Recurrent neural network will be used for the functional purpose of the chatbot where the chatbot will learn from the input provide and the output generated. Using sequence to sequence network with many-to-one framework it will take the different kind of symptoms, the different kind of symptoms would be considered as many inputs and based on the many inputs a single output would be generated.

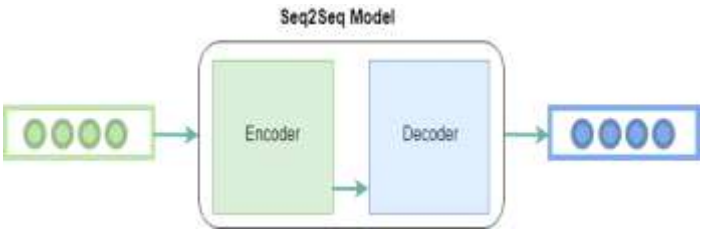

Fig 2: Seq to seq

As the name suggests, seq2seq takes as input a sequence of words (sentence or sentences) and generates an output sequence of words. It does so by use of the recurrent neural network (RNN). RNNs vanilla version are although rarely used, its more advanced version i.e. LSTM or GRU are used. This is because RNN suffers from the problem of vanishing gradient. LSTM is used in the version proposed by Google. It develops the context of the word by taking 2 inputs at each point of time. One from its previous output and other from its user, hence the name recurrent (output goes as input).

4. NEED OF CHATBOT FOR MEDICAL ASSISTANCE

A medical assistance chatbot is today's requirement because it is a basic need of human to know the type of allergy he is having and precautions he need to take to deal with the problem. If based on symptoms a user search on the vast internet about the disease he may lead to false results due to presence of huge amount of false information present on the internet. A chatbot narrows down the information which is verified and true and would lead to accurate result for the user.

5. ADVANTAGES

1. Access to medical assistance quickly.

2. Based on allergy type suggested by chatbot the user can take further reference from specialist doctor in that field.

3. In case of emergency, the user can act quickly.

4. Instead for searching for the allergies with the symptoms on internet where chances of false information are more a chatbot narrow down right information for the user.

6. CONCLUSION

In this paper, we did survey on importance of machine learning using natural language processing for developing a software program for having a conversation with humans where a human would be having a conversation with machine but they won't know that, they will feel like they are having a conversation with another human. We recommend the use of chatbot for this purpose where it would provide the medical assistance to the user based on the input provided by the user which would be the symptoms of the allergies. The software would suggest the name of the allergy and also recommend the specialist the user need to visit.

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