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MEDI COMPANION USING NLP

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Abstract - To start a good life is very important. But it is very difficult to the consult the doctor if any health issues. The proposed idea is to create a medi companion using Natural Language Processing technique it is the part of Artificial Intelligence that can diagnose the disease and provide basic details about the disease before consulting a doctor. To reduce the costs and improve accessibility to medical knowledge the medi companion is built. Some medi companions acts as a medical reference books, which helps the patient know more about their disease and helps to improve their health. The user can achieve the benefit of a medi companion only when it can diagnose all kind of disease and provide necessary information. The system provides text or voice assistance that means user can use his own convenient language. Companion will provides which type of disease based on the user symptoms, and provides doctor details respective to user disease. and also provides food suggestion that means which type of food you have to take. Thus, people will have an idea about their health and have the right protection.

Key Words Healthcare, Artificial Intelligence, Virtual Assistance.

1. INTRODUCTION:

Now a day, health care is very important in our life. Today's people are busy with their works at home, office works and more addicted to Internet. They are not concerned about their health .So they avoid to go in hospitals for small problems.it may become a major problem.

So we can provide an idea is to create a medi companion system using AI that can diagnosis the disease and provide basic information about the disease before consulting a doctor. Which helps the patients know more about their disease and improves their health? User can achieve the all kind of disease information. The system application uses question and answer protocol in the form of medi companion to answer user queries. The response to the question will be replied based on the user query. The significant keywords are fetched from the sentence and answer to those sentences. If match is discovered or significant answer will be given or similar answers will be displayed. Medi Companion will diagnosis which type of disease you have based on user symptoms and also gives doctor details of particular disease. It may reduce their health issues by using this application system. The system is developed to reduce the cost and time of the users as it is not possible for the users to visit the doctors or experts when immediately needed.

2. LITERATURE SURVEY

Here the studies are based on to recognize emotions classification using AI methods. The studies train emotions classification models from a lot of labeled data based on RNN, deep learning, convolutional neural network. Linguistic interaction is most important in counseling using NLP and NLG to understand dialogues of users. Here the multi-modal approach is used of emotion-recognition. They have collected corpuses to learn semantic information of words and represent as vector using the word vector, synonym knowledge of lexical are collected. [1]

In this paper voice recognition is developed, if the questions are not understood asked to the companion is further processed using the third party expert-system. The web-companions are created as text-based web-friends, an entertainer for the user. Here they focused on the improved system if the system is not only text-based but also voice-based trained. Here the voice recognition requires a 2 part process of capturing and analysis of an input signal. Server response recognition data retrieval and information output. The server used here is SOAP based on black box approach. The use of expert system allows unlimited and autonomous intelligence improvements. [2]

This medi companion aims to make a conversation between human and machine. Here the system stores the knowledge database to identify the sentence and making a decision to answer the question. The input sentence will get the similarity score of input sentences using bigram. The medi companion knowledge is stored in RDBMS. [3]

The medi companion implemented using pattern comparison in which the order of the sentence is recognized and saved response pattern. Here the author describes the implementation of the medi companion Operating system, software, programming language, and database. How results input and output is stored. Here the input is taken using text () function and other punctuation is removed using trim () function and random () function is used to choose a response

from the database. The medi companion is used for an entertainment purpose. [4]

Here they use n-gram technique for extracting the words from the sentences. Here n-gram is used for comparison and deduction of the input with case data using Moro phonemes and phonemes as the deciding parameter. Probability analysis for the closest match is performed. The final expression is redirected through an expert system. [5]

The medi companion developed here for purposes for the android application. The user sends the text message or voice message using Google API. Here the user gets only related answer from the medi companion. SVM algorithm is used to classify the dataset. Here the Porter algorithm is used to discard unwanted words like suffixes or prefixes. [6]

The different documents served in web, the content is checked by tagging the dataset using n-gram based low dimensional demonstration, TF-IDF matrix that generates S, U, and V and finally multiplying the 3 matrices cosine similarity is calculated. [7]

Here the medi companion is created for the customer service that functions as public health service. The application uses N-gram, TF-IDF and cosine similarity. The knowledge base is created for storing the question and answer. The application clearly shows extracted the keyword from the question ad by using unigram, bigram, and trigram which helps in fast answering. [8]

3. PROPOSED SYSTEM:

In our proposed system the user can chat with the companion regarding the query through voice or text. The system uses an expert system to answer the queries. User can also view the available doctors for that particular disease. This system can be used by the multiple users to get the counselling sessions online. The data of the medi companion stored in the database in the form of pattern-template. Companion will provide analgesics and food suggestions that means which food you have to take based on the disease

3.1.1Tokenization:

The sentences are separated word by word for increased processing. It separates text into words at whatever point it experiences one of the rundowns of indicated character. All the words are separated from sentences and the punctuation are disposed of. This implies the next steps.

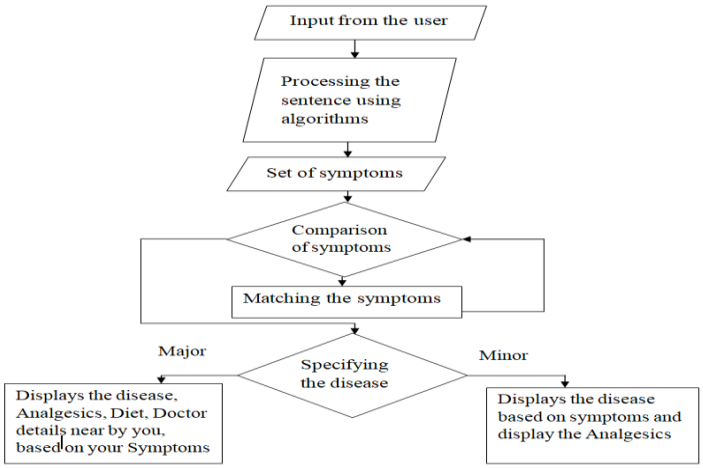
3.1.2Stop words removal:

The stop words are removed from the sentences to extract unique keyword. It is mainly employed to remove unnecessary things such as words occurring too frequently in sentences. It is also used to delete words that are not important or the words with no specific meanings such as an, a, or the. This step is applied to reduce processing time or computational complexity.

3.1.3Feature extraction based on N-gram TF-IDF:

Feature extraction is a characteristic decrease process in the document; it ranks the attributes as per the document. By doing this step it upgrades the speed and adequacy of the document. It is used to extract the set of keywords and frequency of the keywords in the document.

4. Dataflow Diagram:



4.1 Algorithms:

We are using three algorithms to implement health care medi companion system.

1. N-gram Algorithm
2. TF-IDF(Term frequency-inverse data frequency)
3. Cosine similarity algorithm

4.1.1 N-gram Algorithm

N-Grams are way to help machines understand a word in the content to get a better understanding of word. N-gram is a neighboring sequence of n-items from a given sample of text. N-items mean we can have two items, three items and so on. So, it is a contiguous sequence of some items.it helped to predicting the next words in a sentence. Items can be characters, words, sentences. When n are 2 then we can call it as bigrams and n are 3 then we can call it as trigrams. Based on sentence we can change the value of ‘n’.

4.1.2 TF-IDF:

Term frequency(tf):

Generally, when building a model with the goal of understanding text, you’ll see all of stop words being removed.

Another approach is to score the relative importance of words using TF-IDF.

The number of times a word appears in a document divided by the total number of words in the document. Every document has its own term frequency.

Inverse Data Frequency (IDF):

The log of the number of documents divided by the number of documents that contain the word . Inverse data frequency determines the weight of unique words across all documents in the corpus.

$$tf_{i,j} = \frac{n_{i,j}}{\sum_k n_{i,j}}$$

4.1.3 Cosine similarity Algorithm:

Cosine similarity finds a similarity between two non-zero vectors of an inner product space that measures the cosine of the angle between them.

This technique is also used to measure cohesion within clusters in the field of data mining.

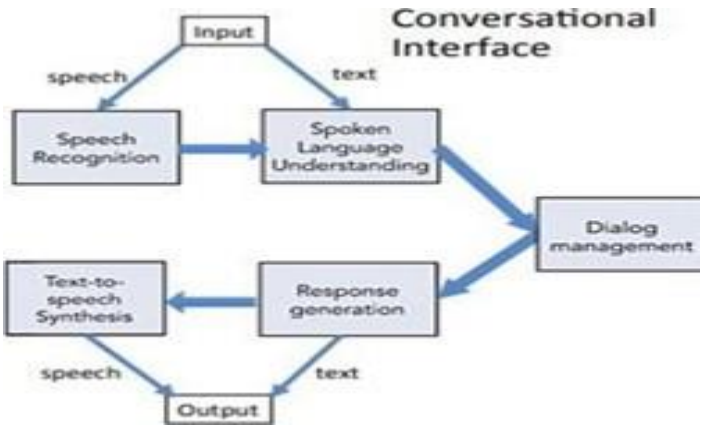
Cosine

$$idf(w) = log(\frac{N}{df_t})$$

similarity=AB/|A||B|.

Cosine distance is nothing but obtaining distance between two vectors in n dimension space. Distance represents how words are related to each other.

5.RESULTS:



6. CONCLUSION:

Medi companion is great tool for conversation between human and machine. The application is developed for getting a quick response from the companion which means without any delay it gives the accurate result to the user. It is concluded that, the usage of medi companion is user friendly and can be used by any person who knows how to type in their own language. Medi companion provides personalized diagnosis based on symptoms.

7. FUTURE ENHACEMENT:

The future era is the era of messaging app because people going to spend more time in messaging app than any other apps. The implementation of personalized medicine would successfully save many lives and create a medical awareness among the people. No matter how far people are, they can have this medical conversation. The only requirement they need simple desktop or smartphone with active internet connection. The efficient of medi companion can be improved by adding more combination of words and increasing the use of database so that of the medical medi companion could handle all type of diseases.

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