



Health Care Chat Bot Using Machine Learning.

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ABSTRACT: -

Being healthy is vital to human existence. Healthcare is becoming more and more important because of the various diseases that are currently rife in society. Technology is revolutionizing the medical field by significantly impacting nearly every procedure and approach used by medical professionals. Many medical professionals—including patients—still manage prescriptions and medical records on paper while providing care, in spite of this. Prescription drugs and previous medical records are becoming more and more necessary for patients to bring to any appointment they make at any hospital or clinic. It is required because the patient's previous medical records aid in the doctor's assessment of the patient's general health and make the development of more effective drugs and therapies easier. However, patients are unable to keep up with all of their medical records indefinitely. Generally, a doctor will question a patient verbally about any previous medical issues, prescriptions, and information about medications, but it can be challenging to elicit specific details from them. It can occasionally be even more crucial for a doctor to treat a patient appropriately and better understand their condition if they are aware of their medical history. Given this, a chatbot specifically created for the healthcare industry is created to allow physicians to enter all patient prescriptions, treatments, and other medical data into software rather than writing it down. All of these records are kept on a central cloud and are accessible to physicians and patients alike. In order to protect the confidentiality of their medical history account, each patient is given a special authentication card. By swiping a smartcard to access their account, doctors can view and update a patient's medical history at anytime, anywhere. Overdue cases can be prevented from entering the system by treatment decisions. Likewise, the system contributes to maintaining drug transparency.

Keywords—: - Healthcare, Artificial Intelligence, Virtual Assistance, TFID, N-gram

I. Introduction

In addition to providing us with information, computers also entertain and assist us in a variety of other ways. Software that mimics intelligent text or voice messaging is called a chatbot. However, text is the only topic this paper addresses. With the assistance of human assistance or online resources, these systems are capable of self-learning and knowledge restoration. This application is very simple because the knowledge is pre-stored. To respond to user inquiries, the system application employs a chatbot that follows the question-and-answer format. This system was created to save users time and money on medical expenses because they are unable to see doctors or other specialists when they need them. The knowledge base and the user's query will be the basis for the answer to the question. The essential terms are removed from the sentences in order to respond to those sentences. In the event that a match or significant result is found, an answer or a list of comparable answers will be provided. An expert has reviewed and responded to the intricate questions and answers in the database. Users can save time by directly asking any questions they may have about healthcare here,

as opposed to visiting a doctor. One type of database management system (RDBMS) stores the input sentence for the chat pattern. The input sentence from the user question would be coordinated by the chatbot with the knowledge base. Every query is cross-referenced with the chatbot's knowledge base. Sentence similarity is identified, and the crucial terms are taken out of the input sentence. N-gram, TF-IDF, and cosine similarity are used to calculate the keyword ranking and sentence similarity. The standalone interfaces were made using the programming language. A chatbot is an artificial intelligence (AI) tool or computer program that mimics textual or audio communication. Websites, mobile applications, messaging apps, phones, and other devices can all be used to contact the user. The purpose of chatbots is to make it easier for people and computers to communicate. These days, the majority of chatbots can be found on specific company websites and applications, messaging apps like Facebook Messenger and Telegram, and virtual assistants like Google Assistant and Amazon Alexa. From a technical perspective, a chatbot is essentially an answer system built on Natural Language Processing (NLP). Typically, chatbots are employed in dialog systems to carry out a range of useful functions, such as information gathering and customer support. Simpler chatbots simply search for keywords in user input and retrieve responses from a database that match or have the most similar wording, although more complex chatbots employ advanced natural language processing (NLP) systems. Conversational commerce, or online shopping via chat, analytics, customer service, design, developer tools, education, entertainment, finance, food, games, health, HR, marketing, news, social, sports, travel, and utilities are just a few of the numerous uses for chatbots. The most popular form of communication, particularly among youth, is text-based messaging because it's "cheap, fast, democratic, and popular."

Literature Review

In this instance, the research employs artificial intelligence techniques to categorize emotions. The study uses a significant amount of labeled data to train models for the classification of emotions using convolutional neural networks, deep learning, and recurrent neural networks (RNNs). When using natural language generation (NLG) and natural language processing (NLP) in counseling to interpret user dialogues, linguistic interaction is crucial. This approach to emotion recognition makes use of multiple modalities. To learn the semantics of words and represent them as vectors using word vectors, they have gathered corpuses. Lexical synonyms are another thing they now know. [1]

In this paper, a voice recognition chatbot is developed. When the bot cannot understand a question, it asks one that is handled by expert systems outside the company. The webbots are intended to be users' online friends, providing text-based entertainment. Here, they focused on the enhanced system in the event that text and voice functionality are also included in the application. In this instance, voice recognition requires two stages of input signal capture and analysis. processing information and taking information out of the server response. This makes use of a SOAP-based black box server. Infinite and autonomous intelligence can be achieved with the help of an expert system. [2]

The goal of this chatbot is to facilitate communication between machines and people. To identify the sentence and choose how to respond to the question, the system here saves the knowledge database. Bigram will be used to determine the input sentence's similarity score. An RDBMS is used by the chatbot to store its knowledge. [3]

The chatbot recognizes sentences based on their order, and it compares patterns to store the response pattern. This section provides an explanation by the author of the chatbot's operating system, software, input and output results, database implementation and storage, and programming language. Here, the text() function is used to extract the input, the trim() function is used to remove any extra punctuation, and the random() function is used to select a response at random from the database. The chatbot wants to make people laugh. *[4]

Here, the words are taken out of the sentences using the n-gram technique. Here, phonemes and Moro phonemes are used as the deciding factor in an input deduction using case data and n-gram

comparison. A probability analysis is used to determine which match is the closest. An expert system redirects the final expression. [5]

This chatbot was developed with a focus on healthcare specifically for the Android app. Using the Google API, the user can send text or voice messages. In this instance, the chatbot only gives the user pertinent answers. The dataset is classified using the SVM algorithm. In this case, superlatives and prefixes are eliminated using the Porter algorithm. [6]

The content of the various web-served documents is verified by labeling the dataset with a low-dimensional demonstration based on n-grams, generating S, U, and V using the TF-IDF matrix, and multiplying the three matrices to compute the cosine similarity. [7]

In this case, a public health service and customer support chatbot are developed simultaneously. The application makes use of cosine similarity, TF-IDF, and Ngram. The question and answer were intended to be stored in the knowledge base when it was created. To aid in quick response times, the application makes use of bigram, trigram, and unigram in addition to clearly displaying the keyword that was taken from the question. [8]

The authors have used AIML and the R programming language to create a framework for communicating with chatbots. This study aims to give students a more interactive way to interact with the university system by proposing a model that is more suitable for educational settings. [9]

II. Proposed System

Conversational virtual assistants, or chatbots, conduct user interactions automatically. Artificial intelligence powers chatbots by leveraging machine learning to comprehend natural language. The primary goal of the paper is to provide users with basic health information. Users must first register on the website in order to ask questions of the bot. If the answer is not in the database, the system consults an expert system to provide the answer. Experts in the field must also register here, providing a variety of details. The data from the chatbot is kept in the database as a pattern or template. The database is managed here via MySQL. The healthcare chatbot application's system architecture outline is shown in Fig. 1. The client types their query as text through the user interface. The chatbot application receives a question from the user, which is routed through the user interface. Tokenization is a pre-processing step in which the literary experiences are tokenized within the chatbot application. After stop words are eliminated, the features are extracted using cosine likeness, TF-IDF, and ngram as the foundation. The knowledge database contains the answers to the questions for convenient access.

Tokenization: To enable further processing, the words or sentences are broken up word by word. Every time it encounters one of the designated character rundowns, it converts the text into words. Every word, even the punctuation, has been removed from the entire statement. This suggests what comes next.

Removal of stop words: In order to extract important keywords from the sentences, the stop words are removed. Eliminating words that are superfluous or overly frequent in sentences is its primary goal. It can also be used to remove superfluous or meaningless words like the, an, and a. This step aims to reduce computational complexity or processing time.

N-gram application for feature extraction TFIDF Feature extraction is a technique that minimizes a document's characteristics by ranking its attributes. This action improves the document's speed and sufficiency. It is employed to extract the document's keyword set and frequency.

TF-IDF: The weight of each term in the sentence is calculated by combining term frequency and inverse document frequency.

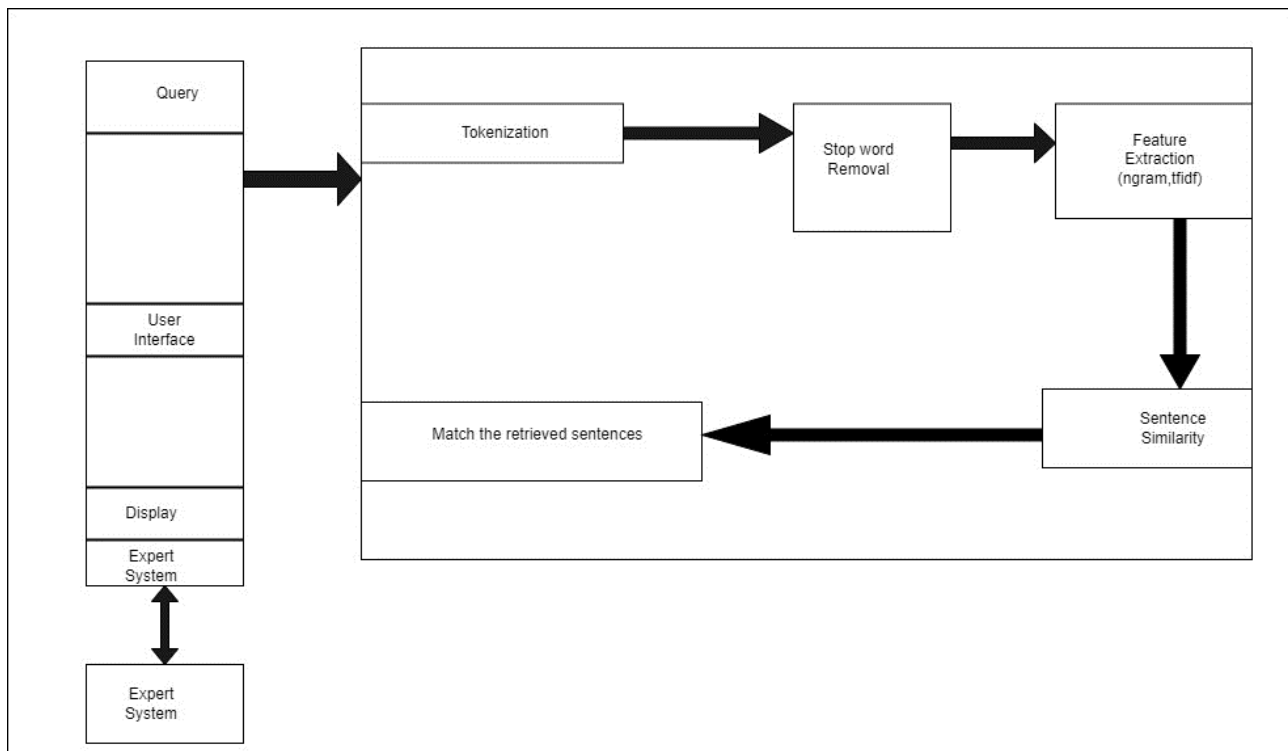


Figure 1 Proposed System Architecture

Health is an essential component of human life. Due to the numerous diseases that are circulating throughout society these days, healthcare is becoming more and more crucial. By having a substantial impact on almost all of the procedures and practices used by medical professionals, technology is revolutionizing the medical industry. Despite this, many healthcare providers—including patients—continue to handle prescriptions and medical records on paper while giving care. Patients are increasingly required to bring prescriptions or prior medical records with them to any appointment they schedule at any hospital or clinic. It is necessary because the patient's prior medical records help the doctor determine the patient's overall health and facilitate the creation of more potent medications and treatments. But patients can't maintain all of their medical records for a long time. A doctor will usually ask a patient orally about any past medical conditions, prescriptions, and medication information, but it can be difficult to get specific information out of them. Knowing a patient's medical history can sometimes make it even more important for a doctor to treat them appropriately and gain a better understanding of their condition. To avoid writing down patient prescriptions, treatments, and other medical information on paper, a smart medical assistant system is designed to enable doctors to input this data into software. Patients and doctors can access all of these records, which are stored on a central cloud. Every patient receives a unique authentication card to safeguard the privacy of their medical history account. Physicians can view and update a patient's medical history from anywhere at any time by swiping a smartcard to log into their account. Treatment decisions can stop overdue cases from entering the system. In a similar vein, the system helps to preserve drug transparency.

Table1 accuracy of algorithms

Algorithm	Accuracy	Precision	F1 Score
Random Forest	0.9843	0.97	0.97
Decision Tree	0.97	0.96	0.96
SVM	0.96	0.95	0.95
KNN	0.97	0.97	0.97
N Gram	0.98	0.98	0.98

NLP :-

Standard bots are rule-based and do not use artificial intelligence (AI); NLP chatbots are not like that. Because standard bots are programmed to conform to the conversational standards that their creator has established, their conversations tend not to feel as organic and genuine. NLP chatbots are capable of comprehending queries with any wording. Additionally, they are able to understand real language, including spelling and grammar errors.

Conclusion

A chatbot is a great tool for conversation. In this instance, the application is made to produce excellent results rapidly. It relieves the answer provider of part of the burden by providing the response directly to the user through an expert system. The project's objective is to reduce users' time when contacting doctors or other specialists for medical assistance. Here, we developed an application that uses the TF-IDF and N-gram to extract the keyword from the user query. Every term is assessed in order to identify the appropriate answer to the question. User feedback queries informed the design of the web interface. Enhancements to the application's security and effectiveness ensure character retrieval, user protection, and question retrieval.

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