

An Approach Towards Chatbot Using Speech Recognition

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Abstract

Chatbot is software that, rather than facilitating direct interaction with a live human agent, conducts online conversations using text or text-to-speech. It is designed to accurately mimic human behavior during conversation. This paper presents a proposed chat system that dynamically responds to web-based customer queries. Speech recognition is the basis of the artificial intelligence used in the proposed system. The web-based platform provides a large intelligence base to help simulate human problem solving. This proposed chat recognizes the context of the user, which determines the specific purpose of the response. The user gets the desired response because it is a dynamic response. The proposed system learns the chatbot through multiple user responses and questions using machine learning techniques. Today, chatbots are becoming incredibly powerful as artificial intelligence helps people in every conversation by understanding a user's question and providing an accurate answer. The goal of the project is to show how chatbots can reduce an organization's dependence on human labor and the need for different systems to perform different tasks.

Keywords: Chatbot, artificial intelligence, machine learning, web-based platform

INTRODUCTION

The utilization of artificial intelligence (AI) to simulate human-bot dialogues has become more and more common. These chatbots can be used for anything from entertainment to household tasks, but it is frequently unclear what exactly these machines are good for. These chatbots' needs and purposes are frequently unclear. An initial conversation with a chatbot may be sparked by curiosity or interest, but in order to improve subsequent exchanges, this should find a widely accepted function with a clear objective. The definition of a chatbot and its appropriate application are relatively new ideas that many find difficult to articulate. Text or voice interactions can result in chatbot experiences, which might vary in value based on the situation. Understanding the user's end mission, the environment, and the individual's whole context are necessary to determine the preferable input modality.

In order to understand how people perceive and interact with chatbots in their daily lives, this study adopts a user-centered approach as opposed to defining a purpose from the viewpoint of the chatbot creator. This assesses chatbots' effectiveness and purpose by knowing whether their experiences meet user expectations and how their services stack up against competitors. This may anticipate this technology being more widely accessible now that chatbots are available on mobile devices (Figure 1).

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LITERATURE SURVEY

Chatbots, also known as conversational interfaces, provide a new way for users to communicate with computers. Previously, to get a software program to answer a question, you had to use a search engine or fill out a form. Similar to how

they would ask a human, a user can effortlessly pose questions to a chatbot [1]. Chatbots are currently being adopted on computer chat networks at a rapid pace.

The technology behind the chatbot revolution is called natural language processing, or "NLP" [2, 3]. With the recent advancements in machine learning, NLP has become much more accurate and efficient, making chatbots a viable option for a variety of businesses. Because of this progress in NLP, a lot more research is being done, which should lead to additional improvements in chat bot efficacy in the years to come. With their increasing prevalence as websites, as we will see in the upcoming years, chatbots have a bright future.

It can be accessed by anyone with a website because it is very fairly priced. The societal use of chatbots has reached an unprecedented level. Most of the chatbot research is concentrated on creating complex chatbots using different algorithms [4]. This study serves as the primary foundation for the results of competent individuals and any program. Chatbots can communicate with a larger audience through messaging and are more efficient than people. They may soon prove to be a useful tool for acquiring information (Figure 2). The present study endeavors to construct a chatbot with an array of features and an understanding of diverse NLP algorithms [5].

PROPOSED SYSTEM

This paper describes the process of building a speech-recognition AI chatbot using pre-trained tools.

Natural Language Processing

The science of AI focuses on programming computers to handle and evaluate enormous amounts of natural language data. AI is the study of how human languages and computers interact. Creating chatbots that are more intelligent has always been the aim of NLP research [6].

Chatbot

Chatbots are computer programs that automatically carry out text-based or text-to-speech chat conversations in order to simulate interactions with people.

Installing and Downloading Packages

Python libraries that must be installed are nltk, NumPy, gTTs (Google text-to-speech), scikit-learn, and SpeechRecognition via pip. To provide access to the system microphone, we will install mpg123 and portaudio in the remaining steps.

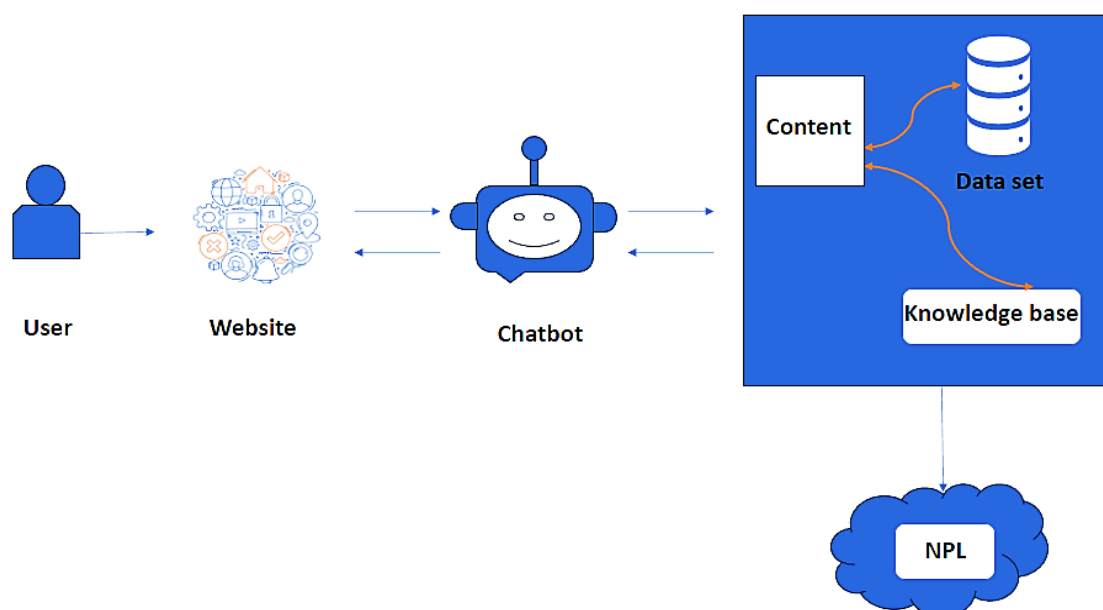


Figure 1. System architecture diagram.

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what is your name?
pd
hi pd, I am chat bot. will you help me learn about your planet?
sure i will explain u
Does Earth have a leader?yes
why do you say that?
earth have more population so we have leader
tell me more.
i tell u later
why do you say that?
because i want more time
i see, can you elaborate
no
why?
sorry
how do you think I feel when you say that?
feel gud
tell me more.
later
okay, have a nice Earth day!

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Figure 2. Sample conversation with chat bot.

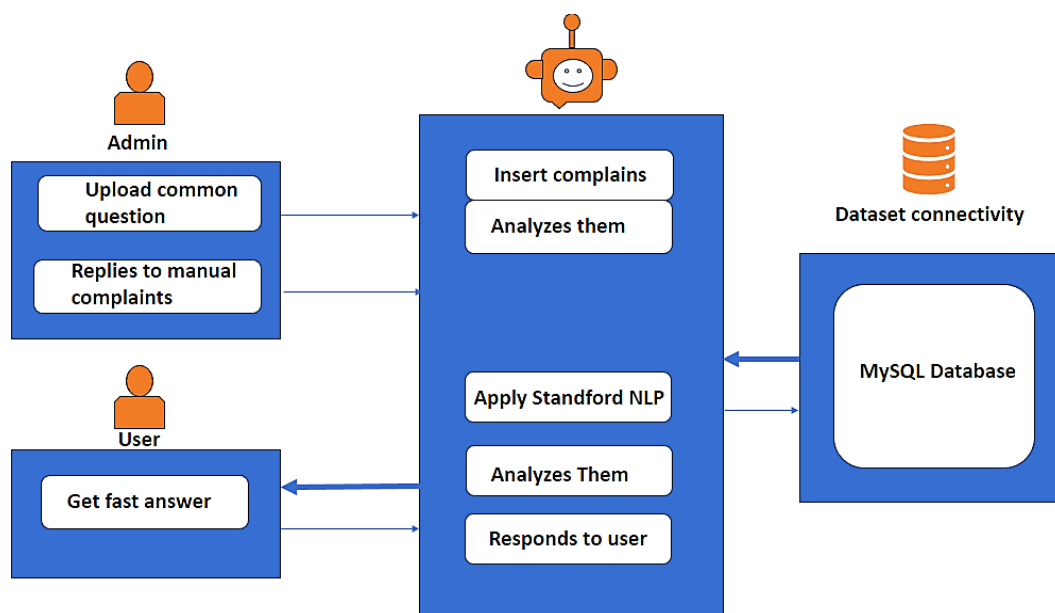


Figure 3. Block diagram for a chatbot.

Calling Libraries

Placing a call at libraries, we may run our script from the import area after installing the required dependencies. Not to mention, the first use of the nltk download command will download those specific corpora [7]. To avoid the application searching for previously collected corpora and increasing runtime, it is therefore recommended to comment on these “.download” statements.

A chatbot responding to user inquiries on a for-profit platform is shown in Figure 3 [8]. To determine the characteristics of a chatbot, we can refer to the block diagram that follows. The diagram that follows shows the whole block diagram.

Speech Recognition

It uses the microphone to register user input through speech recognition. Transforming it into text format, looking up the answers in the processed corpus, and utilizing text-to-speech to speak back the result [9]. It will keep asking questions and responding until the user says “bye” or “goodbye”(Figure 4).

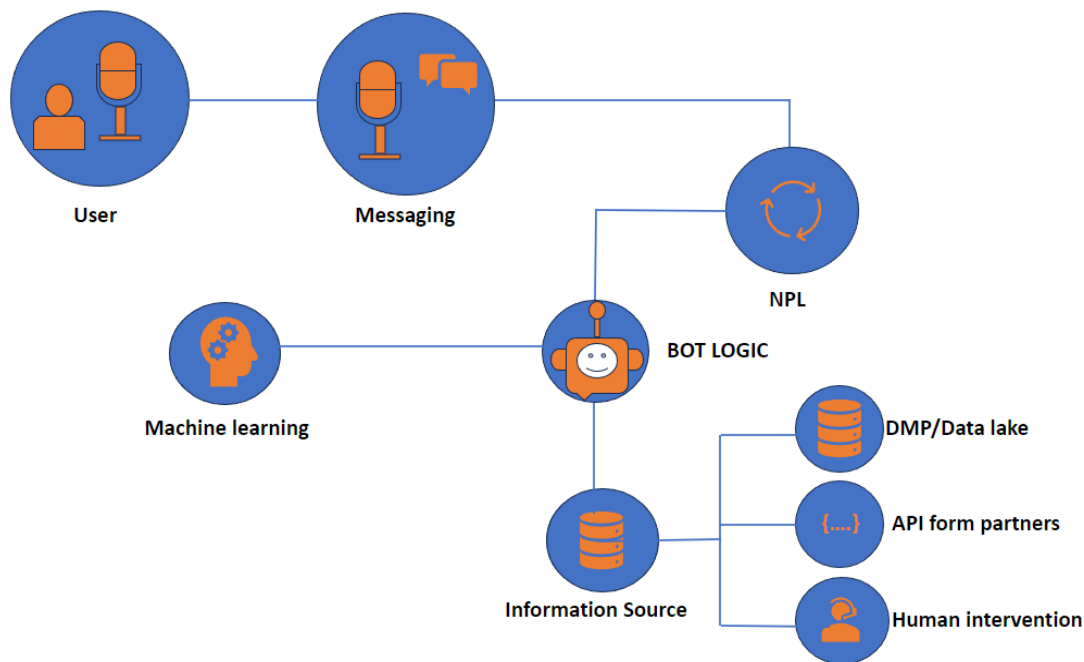


Figure 4. Block diagram for chatbot using speech recognition.

RESULTS AND DISCUSSION

Enhanced User Experience

Natural speech interactions with chatbots and virtual assistants are made more intuitive and user-friendly with the usage of voice recognition technology.

Improved Accessibility

Chatbots and virtual assistants can be efficiently used by people with disabilities or by those who would rather interact hands-free thanks to voice recognition technology.

Faster Input

Speaking can be performed more quickly than writing, particularly when lengthy commands or messages are involved.

Multimodal Interaction

By combining speech recognition with additional modalities like text and touch, multimodal interfaces may be created that give users greater customization options for how they communicate with the system [10].

Improved Insights

By using NLP techniques, chatbots and virtual assistants may comprehend user inquiries more precisely, extract pertinent data, and deliver more insightful answers.

CONCLUSION

This research concludes that speech recognition and NLP enable chatbots and virtual assistants to comprehend and reply to user inquiries in normal language, resulting in more productive and interesting exchanges.

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