Voice Based Chatbot for Student Assistance System

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Abstract

A chatbot is a computer program that simulates human communication to the system by voice or text chats or both. Chatbot are short with man made artificial intelligence feature that can be embedded and used through any major messaging application. A chatbot is interact with customers like a human. Chatbot is a technology that makes communication between man and machines using NLP. Chatbot can give different responses from the same input by using speech recognition. Rich Site Summary(RSS) feeds and expert content processing systems to web users. We cannot translate from one language to another language. Web bots were created as text based web friends for a user. Speech Recognition for application voice message is done by using the HMM algorithm. Exactness of speech Recognition systems differ in vocabulary size. The Voice based chatbots was developed by using Android Application on the basis of HMM algorithm. Android application was developed to process many government based projects using various algorithms. Dragon Speech is a Naturally Speaking Language. As user dictates the words it’ll converts it into text and it displays. HMM algorithm converts speech into a set of words. Speaker dependence vs independence modality of speech. © 2020 VDGOD Professional Association. All rights reserved

Keywords: Chat bot response ranking; HMM algorithm; NLP; Proposed System; Speech recognition.

1. Introduction

The Voice based chat bots is developed by Android Application on the basis of HMM algorithm. Acoustic speech into a words and was performed by the android application.

The chat bots project is built using artificial algorithms that analyses user’s queries and understand user’s message [1]. This system will provides answer to the query of the student. students can ask any question using any format there is no specific format the user has to follow [2]. The system uses built in HMM algorithm and artificial intelligence to answer the query. The answers are appropriate what the user queries. The user can query any student related activities through the application. The user
does not have to personally go to college for enquiry. The system analysis the question and then answers to the user. The system answer to the query as if it is answered by the person. With the help of chatbot, the system answer the query asked by the student. The student replies using an effective graphical user interface which implies that as if a real person is talking to the user. The user just has to register himself to the system and has to login the system. After login user can access to the various student related pages by chatbot. Various helping pages has the chat-bot through which the user can chat by asking queries related to student activities [7]. The user can query about the student related activities through online with the help of the web application and android application. The user can query student related activities such as marks and attendance by using chatbot. This system helps the student to be updated about the student activities.

The service provided are accessed by interface which allows for XML processing, whereas the extensibility improves the lifespan of such a service. By introducing an artificial brain the web based bot provides responses to user. questions asked to the bot, which is not understood is further processed using a third-party expert system(an online intelligent research assistance), and the response is provided, improve artificial brain capabilities for future generation of responses [5].

2. Background

A chatbot is like a normal application. There is an application layer a database and APIs to call other external services. user can easily access chatbots, it adds intricacy for the application to handle. Chatbots can have little to no ‘functionality’ beyond conversation yet still reinforce a strong brand message, which is perfect for marketing campaigns. There’s no other better way to support the message than conversation. With chatbots, messages can engaged in 1-on-1 communication at scale. Brands has the opportunity to personalize each customer’s experience that is unique, scalable, and automated.

3. Existing System

3.1. Introduction

Conventionally web-bot exists, chat-bots were created as text based web-friends, an entertainer for a user. Dragon speech recognition software is a naturally speaking language. This software has three primary features of functionality.

Dictation - The user dictates the words it converted into text format and then it displays.

Text-To-Speech – As text what is present or selected can be converted to speech.

Command Input – User can control the operation by means of his voice without using keyboard by just giving commands.

3.2. Drawbacks of Existing System

- Translation: it cannot translate from one language to another language, therefore here comes translation problem.
- Untrained: it cannot work without training, so training is required.
- Dynamic acceptance is not present.

4. Proposed System

4.1. Introduction

Speech recognition for application voice message was done in google server, using HMM algorithm. Process involves the conversion of acoustic speech into a words and is performed by HMM algorithm. Accuracy of speech recognition system differ in vocabulary size and confusability, speaker dependence vs. independence, modality of speech, task and language constraints. Speech recognition system can be divided into different blocks: extraction, acoustic models database which is built based on the training data, dictionary, language model and the speech recognition algorithm.
4.2. Advantages of Proposed System

Speech recognition systems, based on hidden Markov models most widely applied in modern technologies.

The model output is hidden probabilistic functions.

4.3. System Description

- Speech Recognition: According to R. Shadiev et al. [8], Speech recognition can be done on the basis of text. Dataset must be created for student information etc. Android app is used for speech recognition.

- Technology Demonstrator: Technology demonstrator must be used to verify the bot(web based). In Chatbot android application, give speech input. Then it will show response as text information. A black box approach was used by control the communication.

- Web services: The web services is used for request and response messages. The speech can be accessed using web services. The service provided is accessible using Xml processing. Web-based bot generates customized user responses. Online Intelligent Research Assistant is used for bot purpose.

5. Algorithm

5.1. Hidden Markov Model (HMM)

Hidden Markov Model is a statistical Markov model in which the system being modeled is assumed to be a Markov process with unobservable (i.e. hidden) states. The hidden Markov model can be represented as simplest dynamic Bayesian network. The mathematics with the HMM have developed by the L. E. Baum and coworkers.

![Diagram of Hidden Markov Model](image)

- Formal Definition:
  \[ P(W | A) = P(A | W) \cdot P(W) / P(A) \]
  \[ \arg \max_w EL_p(w/y) \]
  w is string of words, L is the language you are interested, y is the set of acoustic vectors that you are gotten from your front and processor.
  The front end processor is typically an n-dimensional vectors, which represents 10-20 ms of speech. A typical value for n is 8-40 depends on the system.

- Properties of HMM:
  - The HMM is a probabilistic model, in which a sequence of observed X variables is provided by a sequence of internal hidden states Z.
  - A set of M possible observation for each state S1, S2, ..., SN a distribution over possible observations that might be sensed in that state.
  - It comfortable with the kind of math needed to derive the HMM algorithms.

6. Result

Sample of input datasets and the respective di are shown below:
For example: To connect the android and web services, the code is as follows

```java
private static String HTTPSURL="http://chatbot/";
private static String HTTPSURL2="http://192.168.10.100:8080/CICChatBot/CICChatServiceWSDL";
```

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7. Conclusion

The proposed system would be stepping stone in place an intelligent query handling program. An intelligent question answering system has been developed using the HMM algorithm concept. The system is able to answer the query to the student in an interactive way using the chat bot that is used. Although there is still scope for improve, the system performs well in identifying similar question and to a certain extent semantics is also considered. Also because we make use of a filtering process the search space is reduced and so the system becomes more efficient algorithm.

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References
