

An Intelligent Human-Computer Agent

Surbhi Saroha^a, Mamta Bansal^b, Anil K Ahlawat^c

^aLecturer Meerut College Meerut, mona.saroha@gmail.com

^bProfessor Shobhit Institute of Engineering & Technology Deemed-to-be
University, mamta.bansal@shobhituniversity.ac.in

^cDean (Academics) KIET, Ghaziabad, dranilahlawat@gmail.com

Abstract

A Chatbot is a software application. It is the real time chat between a computer and a human. It requires continuous testing. Smart bot interacts with users in their Natural language. The bot can be able to detect emotions on the basis of words used. Chatbot are currently gaining a lot of popularity. As they have automate customer service and reduce human efforts. Its aim is the communication with the user with the help of AIML files and Natural Language Processing (NLP).

All Chatbot have two functions, namely understanding and answering. Chatbot's are of high significance as they are high automated programs that interact with humans just like a human would do. They are cost effective. They interact with human without any time bound and location bound. In this Chatbot we will be making a Chatbot which can express emotions just like humans. It would be human machine conversation and interactions. In order to remove the complexity Frequently Asked Questions (FAQ) bots will be made. They provide a user interface which allows users to type commands and receive instant replays.

Keywords: software application, continuous testing, AIML, Natural Language Processing, automated programs, time bound, location bound.

1. Introduction

A bot is trained to answer questions but it cannot be trained for answering every question. So the problem is solved by Artificial Intelligence Markup Language (AIML) which is based on XML which allows bots to follow rules. The bot will not only detect user's mood but will also help user to uplift user's mood. For example the bot will fetch the jokes from database and deliver it to the user to change user's mood from sad to happy.

The chatbot will be created using Python. Now a day's chatbots are not only used for general interactions but they are also used for specific purpose. As the bot will be for career counselling in computers field.

Chatting is the most popular form of communication these days like Facebook Messenger, SnapChat, WeChat and WhatsApp. In SnapChat the messages are deleted after the messages are read by the user and in WhatsApp the feature of seeing the message read by the user by colored double tick is there. Both these features can be implemented in chatbot for better working. It is likely said that in near future the chatting apps will be replaced by chatbot.

Chatbots can learn and adapt by their experiences. Having the feature of improving over time will give a more accurate and relevant response. The main goal of chatbot is the human touch by machine chatting.

It can be used in emotional and sentiment analysis. Deep learning can be used to make a better chatbots. AI based chatbots can also reduce customers compliance with very less time required.

Chatbots can be used in the following applications:

- For educational purpose.
- For medical field.
- For e-commerce sites.
- For teaching learning process.

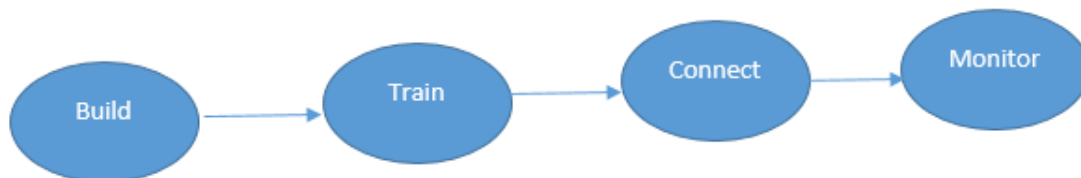


Fig 1. Steps for making chatbot

There are basically three language involved in chatbots they are:

1. NLP (Natural Language Processing)

It is computer reading language. Computers cannot understand the human language completely. Although it can be trained based on previous data fed. If a new word comes it encounters guess which may be wrong some times. In NLP we break a sentence into a number of small pieces and then integrate them together.

2. NLG (Natural Language Generation)

It is computer writing language. AI is not just one language it includes machine learning. NLP and NLG generate language from structured data. It can associate between words or text to create fully or partially machine text. It can predict which words to generate next. It can also generate the complete response. For example in Gmail smart compose option comes. When we write something automatically a written interpretation comes for what the system thinks you would type next.

3. NLU (Natural Language Understanding)

It is computer understanding language e.g. Alexa and Siri. It enables human-machine interaction (HMI). It helps the computer to understand human language and vice-versa. It is a subset to Natural Language Processing. It goes beyond understanding as it even correct the words spelling if the user entered it wrong. The top companies working on NLU are Amazon's with Alexa, Google Assistant, Apple's Siri and Microsoft's Cortanas.

2. History of Chatbot

The history of chatbot is as follows:

1. 1950

Alan Turing published a paper named Computing Machinery and Intelligence. In which he tried to achieve the imitation Game.

2. 1956

Artificial Intelligence (AI) came into existence at the Dartmouth Conference.

3. 1966

Eliza was published by Joseph Weizenbaum which mimick human conversation. Eliza works that users enter into a computer and then matches it and sends the scripted response.

4. 1970

Terry Winegrad publishes Shrdw, a natural language system working restricted vocabularies.

5. 1988

Rollo Carpenter creates a bot in natural human chat and humorous manner.

6. 1994

Michael Mauldin invented the word chatterbot.

7. 1995

Richard Wallace develops Artificial Intelligence Markup Language (AIML) as the foundation for Artificial Linguistic Internet Computer Entity (ALICE).

8. 2001

Smarter child bot came into existence. In which apple's Siri and Samsung's voice were made.

9. 2006

IBM introduced Watson which used Natural Language Processing (NLP).

10. 2010

Apple created Siri in which natural language was used to answer voice commands.

11. 2016

Facebook created and allowed developers to create interactive bots on the Facebook Messenger platform.

3. Types of Chatbot

Chatbot is an intelligent conversation system. There are two types of chatbot.

They are:

1. Learning based chatbot

They are the chatbots which reply to specific inbuilt or predefined questions. In this type the chatbot is limited to input options for accurate reply from the bot.

2. AI based chatbot

They require many logic implementation. They include deep learning bots, end-to-end systems and sequence-to-sequence bots. Now, a day's bots are very popular. They can be used to solve the problems of the students to see the scope and solving their career associated queries.

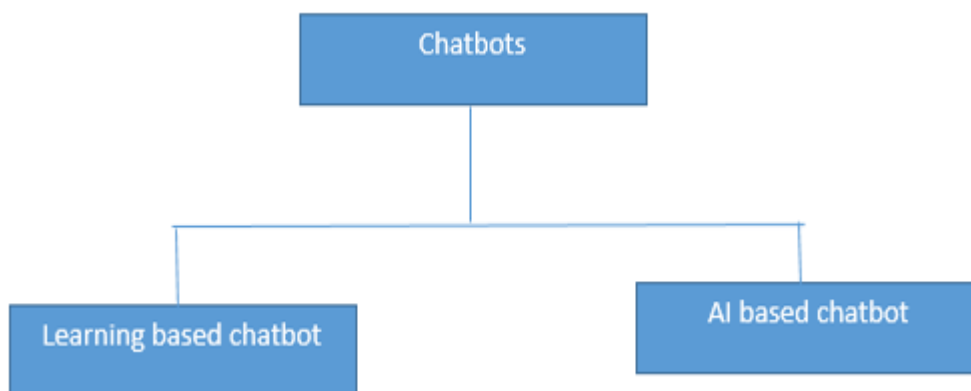


Fig.2 Types of Chatbot

4. Methodology

In the proposed work user utterances will be provided as input in the proposed algorithm. The input query will be matched with the proposed algorithm. Then the query scenarios will be divided into three parts. They are:

1. In case of complete input query matching.
2. Incomplete input query.
3. Invalid input query.

Sample

User: Who are you?

ChatBot: I am your friend.

User: What is your name?

ChatBot: My name is ChatBot.

User: What do you do?

ChatBot: I solve user's problems.

User: What kind of problems?

ChatBot: All kinds of problems.

User: Do you know me?

ChatBot: Yes, you are my user.

The programming language used by the bot will be Python. For the chatbot knowledge the use of AIML file will be done. As the AIML file uses pattern and templates to tell the bot how to respond. These files content is written in notepad.

Carrerbot is implemented using AI based learning. The block diagram of the proposed system is elaborated in Fig 3.

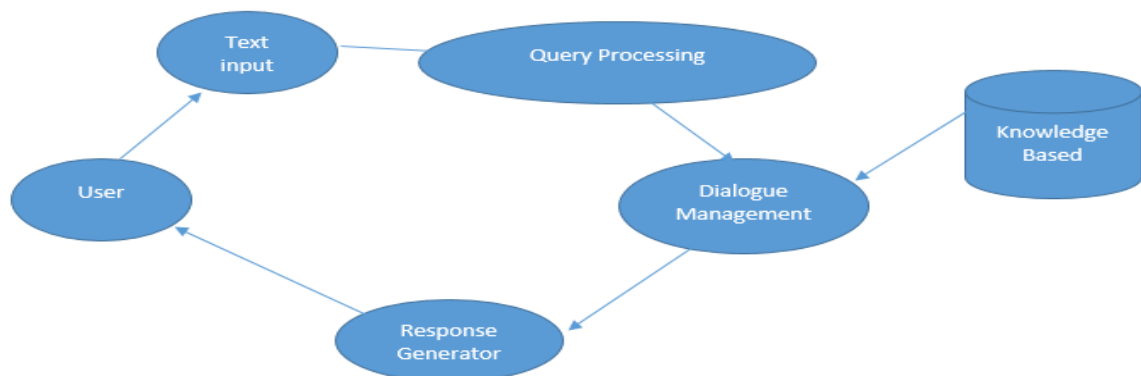


Fig 3. Block diagram of Proposed System

1. NLP

Natural Language processing deals with the communication between the machine and human language. Using NLP sentiments analysis is also possible.

2. Query Processing

It is the most important step when it comes to machine learning. As machine do not understand the data as humans, so we need machine learning algorithm.

3. AIML

AIML stands for Artificial Intelligence Modelling Language. It is XML based markup language used to create AI applications.

AIML Tags

<aiml> defines the beginning and end of an AIML document.

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<pattern> defines the pattern to match what a user input.

<template> defines the response to user's input.

<think> used in AIML to store variable without notifying the user.

<random> It selects random response.

Sample:

```
<category>
```

```
<pattern> Hi </pattern>
```

```
<template>
```

```
<random>
```

```
<li> Hello! </li>
```

```
<li> Hi! </li>
```

```
</random>
```

```
</template>
```

```
</category>
```

Output

Human: Hi

Bot: Hi

Human: Hi

Bot: Hello!

4. Response Generator

Once the user request is processed the application can now response. The answer is given by knowledge based by AIML.

5. Conclusion

A Chatbot is a software application. It is the real time chat between a computer and a human. It requires continuous testing. It was earlier known as a chatterbot made by Michael Mauldin in 1994. They have been used in customer services and information gathering. Customer service is the service provided to the customers 24x7 till the life of the product. Information gathering is the collection of data and problems faced by the communities.

Some Chatbot works on the Artificial Intelligence concept while some work on the associated library concept. AI is the way in which a machine thinks like humans. Libraries connected with each other are the associated libraries.

All Chatbot have two functions, namely understanding and answering. Chatbot's are of high significance as they are high automated programs that interact with humans just a human would do. They are cost effective. They interact with human without any time bound and location bound. In this chatbot we will be making a chatbot which can express emotions just like humans. It would be human machine conversation and interactions. In order to remove the complexity Frequently Asked Questions (FAQ) bots are made.

This paper focuses on the steps for making chatbot and languages used in it. It also tells its types. The methodology is also explained as it involves AI so AIML is used. The goal of bot is to achieve human conversational capabilities.

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