TRANSFORMER CONVERSATIONAL CHATBOT IN PYTHON

A Project Report Submitted by

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ABSTRACT

Chatbots is a computer program that conducts a conversation through auditory or textual methods. Conversational chatbots is a trending topic in artificial intelligence research. These bots are often powered by retrieval-based models, which outputs predefined responses to questions of certain forms. Chatbots, too often are unable to understand our intentions, have trouble getting us the correct information, and are sometimes just exasperatingly difficult to deal with. Deep learning is one of the most effective method in tackling this tough task. TensorFlow 2.0 are with all changes and improvements that can be used for building complicated models with ease. This chatbot will use Cornell Movie-Dialogs Corpus for conversation. Cornell Movie-Dialogs Corpus was used as the dataset. Implementing Multi-Head Attention with Model sub-classing. Implementing a Transformer with Functional API.

SYSTEM REQUIREMENT SPECIFICATION

1. Problem Summary

Chatbot or Chatterbot term was introduced by Michael Mauldin describe the conversational programs. The conversational programs provide support in designing various messenger-based applications. Besides, the chatbot could help to improve responsiveness, increase availability, and reduce dependence man-power in today's world of automation.

We have tried to create a General Purpose Chatbot by feeding it an open-source data. The chatbot would be helpful in a normal conversation and later on various features can be added.

2. Aim and Objectives

2.1 Aim

To build a General Purpose chatbot which will help in normal day-to-day conversation with the user.

This tool helps add convenience for customers—they are automated programs that interact with customers like a human would and cost little to nothing to engage with.

2.2 Objectives

- The chatbot will have a textbox which will be a medium for user to interact.
- Chatbot will have human-like conversation with the user.
- Chatbot will be created using transformer i.e., TensorFlow 2.0
- Other benefits going to be achieved from mentioned aim

3. Literature Review and Prior Art Search (PAS)

Chatbot aims to make communication between a human and machine such as computer and mobile [4]. Recently a considerable amount of promising work has been conducted in the area of chatbot design. O. V. Deryugina presented a detailed survey on the history of the chatbot, their applications, and the first designs of such systems. Bordes et. al, presented an intelligent question answering system which achieved competitive results. They trained their model using low-dimensional embedding of words and knowledge base constituents and used these representations to score natural language questions against candidate answers. Pareira et.al presented an overview of the chatbot early contributions and tried to map those with the current works in the human machine interaction research.

We have noticed that the chatbot related research is mainly distributed in the following areas, (i) different approaches (e.g. retrieval and generative), (ii) length of the conversation, and (iii) according to the domain (e.g. open and closed). Retrieval-based models use a repository of predefined responses and a heuristic to pick an appropriate response based on the input and context. The heuristic could be as simple as a rule-based expression match or as complex as an ensemble of machine learning classifiers. The process of machine learning is similar to that of data mining. Both systems search through data to look for patterns.

4. User details (types of users, roles and responsibilities)

List all the user categories and describe their roles and responsibilities

4.1 API user

API users consist of application developers who want to incorporate AFR Chatbot API into their software application, such as police bots or any home robots etc.

4.2 Mobile app user

These users consist of non-technical users who want to get answers for their question. These users ask questions and get answers for those questions.

4.3 Administrator

These users are administrator or managers of the software. They are responsible for making any changes to the software, providing answer to the queries etc.

5. Module-wise functional requirement

5.1 Function Requirement

- Chatting: The system should allow users to chat.
- Administrative: The administrator should be able to to add, update and delete questions, answers and keywords.
- Searching: The system should allow users to search for information.
- Logs: The system should maintain a log of the current question and answer if the user is not satisfied.

5.2 Non-Functional Requirements

- User Interface: The system shall maintain an easy-to-use interface across all functionality and for all users.
- Scalability: The system shall be able to scale based on the number of users using the system.
- Maintainability: The system should be easy to maintain.
- Portability: The system should run on a variety of hardware.

6. Hardware and Software requirement

6.1 Hardware requirement for the development and deployment of the project

- CPU: 2.3 GHz Processor and above
- RAM: 4 GB or above
- OS: Windows 7 or above

6.2 Software requirement for the development and deployment of the project

- Operating System -Window/ Android/ MAC-OS/IOS
- Python – Keras, Numpy, Pandas, Matplotlib,
- Dataset-Cornell Movie--Dialogs Corpus
- Spyder IDE, Google Colab
- Anaconda