

An Efficient Deep Learning Based Chatbot for GRIET

Ashlin Deepa R N
 Computer Science Engineering
 Gokaraju Rangaraju Institute of
 Engineering and Technology
 Hyderabad, India
 rndeepa.pradeep@gmail.com

Sai Sravya Thumati
 Computer Science Engineering
 Gokaraju Rangaraju Institute of
 Engineering and Technology
 Hyderabad, India
 saisravvyat99@gmail.com

Sandhya Reyya
 Computer Science Engineering
 Gokaraju Rangaraju Institute of
 Engineering and Technology
 Hyderabad, India
 sandhya.chandrika01@gmail.com

Abstract—This work aims to develop a chatbot that can provide required information about the educational institute, GRIET. At present, there is no chatbot system available for the institute's website. The entire website needs to be scrolled in order to get the required data. The proposed chatbot, GrietBot, helps in easy access of information for the user's query. The chatbot model exploits algorithms in order to process user queries and retrieve appropriate information efficiently. Various text preprocessing techniques and deep learning techniques are used to provide the state of art model in developing the first chatbot for GRIET. This chatbot helps access the information faster without the user's physical presence in this pandemic.

Keywords—Chatbot, text preprocessing, natural language processing, deep learning, deep neural network.

I. INTRODUCTION

In this pandemic situation, users expect all their queries to be answered without time consumption and physical presence. But the users are still facing the challenge of finding the right information at the right time. A chatbot is an application that gives answers to human beings in a natural way (the way we interact with one another) [11], [12].

GRIET (Gokaraju Rangaraju Institute of Engineering and Technology [1]) is located in Hyderabad, the capital city of Telangana state in India, is accredited with NAAC A++ grade which is one of the topmost colleges in the state. People always want to know more about the college either to get admission or inquiry. To make all the information available easily and to reduce in-person contact in this pandemic, a chatbot, GrietBot is proposed in this project. GrietBot is going to be the first chatbot for the GRIET college.

College inquiry system "GrietBot" will help in fast, standard, and righteous information retrieval to enhance the college website's user experience. After receiving the users' queries, the chatbot understands and responds accordingly [4]. In this process of developing the first chatbot for GRIET, GrietBot, various existing chatbots are studied and are discussed in the following section.

II. RELATED WORK

Chatbots use different logic based on their usage in the market. Different domains of chatbots are goal-based, knowledge-based, service-based, and response generated-base [2]. The model that responds to the user queries based on keyword matching comes under context-centric natural language processing (NLP) [3]. The process starts by tokenizing, sentence detection, and POS tagging and stem the extracted words after extracting the subject-verb predicate.

The response is given based on the relevance score and the threshold value.

The Adobot approach [4] is to provide the technical support only for What- and How- questions. These What- and How- questions improve the accuracy of user queries by processing knowledge at the semantic level. This serves as the semantic framework for the analysis of user inputs and generates responses accordingly.

There is also a model which makes use of AIML (Artificial Intelligence Markup Language) files to store the question and answers pair [5]. When the user converses with the chatbot, if the input query is matched to patterns, the corresponding response is returned to the user. Otherwise, the keywords are extracted from the query and a response is given based on the similarity between the user query and the patterns.

In the model [6] the user query is pre-processed for removing links, images, Twitter ID, punctuations, numbers, emojis, non-English words and replacing abbreviations with their long forms. Feature extraction is performed using the Bag-of-words and LSTM (Long Short-Term Memory) which can store past important information and forget the information that is not useful. GRU (Gated Recurrent Units) is similar to LSTM but trains faster and more efficiently. CNN (Convolutional Neural Network) can identify required patterns in the sentences regardless of their position. These models are built where LSTM outperforms the rest of the models.

A survey in UK university concludes many factors affect the students to use chatbots [7]. Performance expectancy, effort expectancy, and habit are the three main factors that increase the interest to use a chatbot. UTAUT2 (Unified Theory of Acceptance and Use of Technology 2) is the model used for the survey. In [8], different functions are designed to take the input, get the response, clean the text from the chatbot using java. It is a simple and user-friendly chatbot that uses pattern matching [16], which is the challenging research area in various real time applications and the flexibility of changing the functioning is more for admin. Models using Seq2Seq, LSTM chatbots are more interactive and natural [9].

In this model, the Attention mechanism focuses on the important content. It always tries to answer with the best and most accurate response. Another chatbot that is built using Facebook messenger API uses the python backend [10]. This includes the WIT.AI library which contains a pre-trained neural network to respond to the user's query. The delivery of the user's input from the interface to the server is carried by a webhook.