

## CHATBOT USING LARGE LANGUAGE MODEL

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*Abstract- The concept of Natural Language Processing has seen a remarkable advancement in the recent years. This remarkable advancement was particularly with the development of Large Language Models (LLM). Large Language Models are used to develop a human like conversations. This LLM is a part of Natural Language Processing which focuses on enabling computers to understand, interpret, and generate human language. The existing system of chatbots does not generate human like responses. The proposed system of chatbots uses the power of Large Language Models to generate more human like responses, providing the conversation in a natural way. By generating human like responses, it will be in a natural way for the user. To enhance user experience, the chatbot uses a dynamic learning mechanism, by which it continuously adapt to user preferences and evolving conversational patterns. This system uses feedbacks from the users to refine its responses everytime. Moreover, the chatbot is designed with a multi-turn conversational context awareness, allowing it to maintain coherence and relevance throughout extended dialogues. The effectiveness of the proposed chatbot is evaluated through user testing, comparing its performance against traditional rule-based chatbots and existing conversational agents. This report explains about the usage of Large Language Models in the*

*design and implementation of conversational chatbots. The outcomes of this research contribute to the advancement of intelligent chatbot systems, demonstrating the potential of large language models to significantly enhance conversational AI applications.*

### INTRODUCTION

The evolution of Artificial Intelligence (AI) and Natural Language Processing (NLP) has witnessed a transformative breakthrough with the development of Large Language Models (LLMs). Large Language Model represents an advanced language model that undergoes training on an extensive corpus of text data. The existing system of chatbots are like Traditional chatbots which generates responses in a more machine like way. It will be like asking questions to a machine, by which the user would get bored. To generate the responses in a more natural way, in the proposed system we use the power of LLMs to generate human like responses. By using deep learning techniques, Large Language Models can produce human-like text, making them highly versatile for a range of applications. These include text completion, language translation, sentiment analysis, and much more. Currently there are some challenges and limitations in chatbots. Initially in the process, we have to define intents and collect details. As the number of intents increases,

managing and disambiguating them becomes difficult. To overcome these challenges, Large Language Models. Large language models (LLMs) provide a new way to build chatbots by accepting natural language prompts. Yet, it is unclear how to design prompts to power chatbots to carry on naturalistic conversations while pursuing a given goal such as collecting self-report data from users. We explore what design factors of prompts can help steer chatbots to talk naturally and collect.

## LITERATURE REVIEW

We propose MPC (Modular Prompted Chatbot), a new approach for creating high-quality conversational agents without the need for fine-tuning. Our method utilizes pre-trained large language models (LLMs) as individual modules for long-term consistency and flexibility, by using techniques such as fewshot prompting, chain-of-thought (CoT), and external memory. Our human evaluation results show that MPC is on par with fine-tuned chatbot models in open-domain conversations, making it an effective solution for creating consistent and engaging chatbots. Large language models (LLMs) provide a new way to build chatbots by accepting natural language prompts. Yet, it is unclear how to design prompts to power chatbots to carry on naturalistic conversations while pursuing a given goal such as collecting self-report data from users. We explore what design factors of prompts can help steer chatbots to talk naturally and collect data reliably. To this aim, we formulated four prompt designs with different structures and personas. Through an online study ( $N = 48$ ) where participants conversed with chatbots driven by different designs of prompts, we assessed how prompt designs and conversation topics affected the conversation flows and users' perceptions of chatbots. Our chatbots covered 79% of the desired. Large language models (LLMs) provide a new way to build chatbots by accepting natural language prompts. Yet, it is unclear how to design prompts to power chatbots to carry on naturalistic conversations while pursuing a given goal, such as collecting self-report data from users. We explore what design factors of prompts can help steer chatbots to talk naturally and collect data reliably. To this aim, we formulated four prompt designs with different structures and personas. Through an online study ( $N = 48$ ) where participants conversed with chatbots driven by different designs of prompts, we assessed how prompt designs and conversation topics affected the conversation flows and users' perceptions of chatbots. Our

chatbots covered 79% of the desired information slots during conversations, and the designs of prompts and topics significantly influenced the conversation flows and the data collection performance. One of the major drawbacks of modularized task-completion dialogue systems is that each module is trained individually, which presents several challenges. For example, downstream modules are affected by earlier modules, and the performance of the entire system is not robust to the accumulated errors. This paper presents a novel end-to-end learning framework for task-completion dialogue systems to tackle such issues. Our neural dialogue system can directly interact with a structured database to assist users in accessing information and accomplishing certain tasks. The reinforcement learning based dialogue manager offers robust capabilities to handle noises caused by other components of the dialogue system. Our experiments in a movie-ticket booking domain show that our end-to-end system not only outperforms modularized dialogue system baselines for both objective and subjective evaluation, but also is robust to noises as demonstrated by several systematic experiments with different error granularity and rates specific to the language understanding module.

## EXISTING SYSTEM

Developed by OpenAI, GPT-3 is one of the most powerful and widely known language models. It has been used to create chatbots that can engage in conversations, answer questions, and generate human-like text. Based on the GPT-3 architecture, ChatGPT is a specific implementation that demonstrates the conversational capabilities of large language models. It can be used for a wide range of applications, from natural language understanding to creative writing. Rasa, an open-source conversational AI platform, can be integrated with large language models for advanced natural language understanding. This allows developers to leverage the power of these models within the Rasa framework for building chatbots. Microsoft's Bot Framework can be enhanced with the use of large language models to improve the conversational abilities of chatbots built on the platform.

## PROPOSED SYSTEM

The proposed application involves integrating a large language model with extensive knowledge to create a chatbot capable of providing accurate and context-aware information on organization-related

queries. The chatbot could assist users in understanding questions. A proposed educational chatbot could leverage a large language model to offer personalized tutoring. It would adapt to individual learning styles, answer questions across various subjects, and provide explanations in a manner similar to human tutors. Integrating a large language model with legal expertise could result in a chatbot capable of analyzing legal documents, answering legal queries, and providing insights into complex legal scenarios.

## HARDWARE REQUIREMENTS

## DESIGN

### PREPARING DATASET

The JSON dataset is a JSON document, which includes metadata, such as column names and types, as well as the dataset name. Since it has a normalized and well-known structure, it can be used to return data in a predictable Format, for example, when building REST APIs in Etlworks Integrator. To create a new JSON Data Set Format, go to Connections, select Formats tab, click Add Format, type in json data set in the search field, and select JSON Data Set. Note that it is not the same as JSON. Dataset-JSON was adapted from the Dataset-XML Version 1.0 specification but uses JSON format. Like Dataset-XML, each Dataset-JSON file is connected to a Define-XML file that contains detailed information about the metadata. JavaScript Object Notation (JSON) is a standard text-based format for representing structured data based on JavaScript object syntax. It is commonly used for transmitting data in web applications (e.g., sending some data from the server to the client, so it can be displayed on a web page, or vice versa).

### TOKENIZATION

Tokenization, in the realm of Natural Language Processing (NLP) and machine learning, refers to the process of converting a sequence of text into smaller parts, known as tokens. These tokens can be as small as characters or as long as words. The primary reason this process matters is that it helps machines understand human language by breaking it down into bite-sized pieces, which are easier to analyze. The primary goal of tokenization is to represent text in a manner that's meaningful for machines without losing

- High Performance GPU
- High Performance CPU
- Large Memory (RAM)
- Storage

## SOFTWARE REQUIREMENTS

- Deep Learning Frameworks
- CUDA and cuDNN
- Distributed Computing Tools

its context. By converting text into tokens, algorithms can more easily identify patterns. This pattern recognition is crucial because it makes it possible for machines to understand and respond to human input. For instance, when a machine encounters the word "running", it doesn't see it as a singular entity but rather as a combination of tokens that it can analyze and derive meaning from.

## LEMMATIZATION

Lemmatization is the process of grouping together different inflected forms of the same word. It's used in computational linguistics, natural language processing (NLP) and chatbots. Lemmatization links similar meaning words as one word, making tools such as chatbots and search engine queries more effective and accurate. The goal of lemmatization is to reduce a word to its root form, also called a lemma. For example, the verb "running" would be identified as "run." Lemmatization studies the morphological, or structural, and contextual analysis of words. To correctly identify a lemma, tools analyze the context, meaning and the intended part of speech in a sentence, as well as the word within the larger context of the surrounding sentence, neighboring sentences or even the entire document. With this in-depth understanding, tools that use lemmatization can better understand the meaning of a sentence.

## BAG OF WORDS

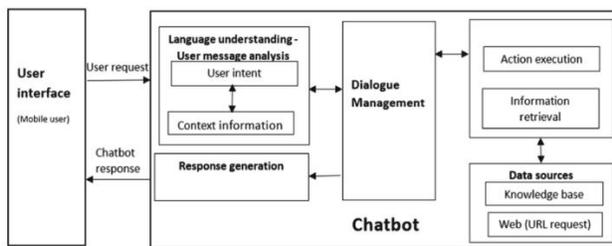
Bag of words is a Natural Language Processing technique of text modelling. In technical terms, we can say that it is a method of feature extraction with text data. This approach is a simple and flexible

way of extracting features from documents. A bag of words is a representation of text that describes the occurrence of words within a document. We just keep track of word counts and disregard the grammatical details and the word order. It is called a “bag” of words because any information about the order or structure of words in the document is discarded. The model is only concerned with whether known words occur in the document, not where in the document.

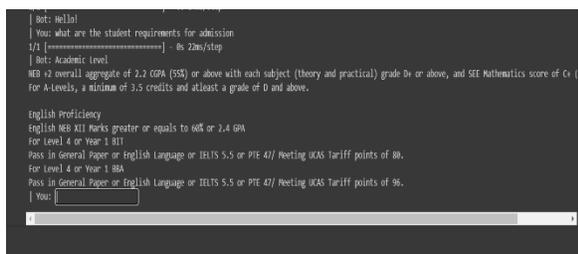
### PREDICTION

There are a number of approaches to text prediction. In other articles I’ve covered Multinomial Naive Bayes and Neural Networks. One of the simplest and most common approaches is called “Bag of Words.” The approach is relatively simple: given a set of topics and a set of terms associated with each topic, determine which topic(s) exist within a document (for example, a sentence). While other, more exotic algorithms also organize words into “bags,” in this technique we don’t create a model or apply mathematics to the way in which this “bag” intersects with a classified document. A document’s classification will be polymorphic, as it can be associated with multiple topics.

### FLOWCHART



### RESULT



### CONCLUSION

The integration of Large Language Models (LLMs) into chatbot frameworks represents a significant advancement in the search for more natural, context-aware, and engaging conversational interfaces. As we overcome certain challenges and limitations in this study, some takeaways emerge. The key takeaway is the usage of Large Language Model in this proposed system of chatbot has helped to overcome the challenge and limitation of increased number of intents. This Large Language Model has also made the chatbot to generate human like responses. The next generation of Language Model Systems (LLMs) and LLM chatbots are expected to offer improved accuracy, expanded language support, enhanced computational efficiency, and seamless integration with emerging technologies. These advancements indicate a higher level of versatility and practicality compared to the previous models. Recent strides in LLMs have been remarkable, and their future appears even more promising. Although we may not be fully prepared, the future is already unfolding, demanding our adaptability to embrace the opportunities it presents.

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