EchoBot - Chatbot to mimic your speech

專題編號:113-CSIE-S016
執行期限:112年第1學期至113年第1學期
指導教授:江佩穎
專題參與人員:110590042 柳艾德

Abstract

In an increasingly digital world, communication has evolved beyond traditional channels. Chatbots, powered by artificial intelligence, play a crucial role in enhancing user experiences. However, most chatbots lack the ability to adapt to individual speaking styles, leading to impersonal interactions.
Most innovations are the result of trying to make things more convenient for people, to make things easier and more efficient in our everyday lives, or sometimes simply just for entertainment. Following a machine learning paradigm known as imitation learning or behabiour cloning, the goal is have AIs get closer to human levels of interaction.

Reasons and Purpose

The initial purpose of the project was to create a text generating linguistic tool that could assist the user in writing and responding to messages that they receive..in creating an interactive chatbot that understands subtleties in speech, such as tones and sarcasm so that it can identify these qualities in the user's messages and generate them too. learns and adapts to users' unique speaking habits. By dynamically adjust its responses to match their preferred tone, vocabulary, and style. To communicates in a way that feels familiar and personalized.

analyzing input from users, the chatbot will

Key Features

Develop algorithms to capture users' linguistic patterns, including sentence structure, word choice, and emotional nuances.
Implement real-time adjustments based on user interactions, ensuring that the chatbot's responses align with the user's preferred style.
Incorporate user feedback to fine-tune the chatbot's adaptation process over time.

Potential Impact

Enhanced User Engagement: Users will feel more connected and understood, leading to improved engagement with the chatbot.
Personalized Conversations: The chatbot's ability to mimic users' speaking habits will create a more natural and enjoyable dialogue.

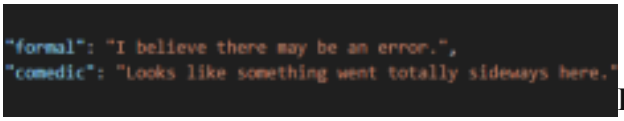
Tools used

All code was written in Python, training sessions were done on local machine and Google Collab. Open source datasets were used, such as Movie Corpus, Persona as well modifying them to my needs.

Results

Over the course of the development of this project I have gone through many different models for my chatbot. In order to begin my project I needed to have an understanding of natural language processing in machine learning, so I started off with training a chatbot from scratch using a sequence to sequence architecture to train a bot to predict what words to respond with when given an input, based on training from dialogue datasets and movie corpus.

As I progressed I saw the limitations of this model, as it took long periods of time till it would yield any results. With further research I realised that Open source Transformer models, such as GPT2 or BERT, would be a much better base for my project as they are already pre-trained to a certain extent, allowing for training sessions to yield better results at a much quicker rate



The initial goal was to have the chatbot

Conclusion

The overall goal of the project was to provide a tool which is capable of assisting the user in generating messages. Initially by first interacting with the user to gain data on how they type, so that it in theory could train off of it and to be able to generate similar pieces of texts.

However, in this regard my project did not meet its goal, as I wasn't sure on how to implement a dynamic learning algorithm in a way that would not negatively affect the model. Where I found myself at the end was with a chatbot that could generate responses to the user's inputs, essentially it could maintain a simple conversation, though it would occasionally lose context. From there I looked at how I could build upon that in order to reach my goal, or get to a stage where I had achieved some of the key features. Being able to somewhat understand linguistic subtleties was a major function that needed to be achieved, so I used varying datasets of sentences that alternate in tone, yet retain the same meaning so that my bot can learn to adjust sentences as such.

understand the user's speech and tone, as well as other speacking/typing habits. I thought at first the best way to tackle this task was to implement dynamic learning algorithms, however I soon realised that this might be more challenging due to issues in lack of training data or causing an over fitting issue in the model. So instead i took another approach to train the model is a few categories of linguistic tones, like formal, informal and comedic. This approach would have the model ready with these different understandings of human speech, so it could be capable of not only generating similar messages, but could convert a sentence from one tone to another, like a formal sentence to a comedic one.

Although I was not able to implement every feature I'd of liked to, the end product retains the essence of the vision, and has a lot of room for growth with the use of better quality datasets and model training.

References:

Conversational AI with Rasa: Build, test, and deploy AI-powered, enterprise-grade virtual assistants and chatbots by
Xiaoquan Kong, Guan Wang.

Connecting AI: Merging Large Language Models and Knowledge Graph by Mlađan Jovanović, Singidunum University, Belgrade, Serbia Mark Campbell, EVOTEK, San Diego, CA, USA

https://github.com/patrickloeber/pytorch-chatb ot/blob/master/train.py

https://github.com/xcapt0/gpt2_chatbot/tree/m aster