AI Chatbot with user's speech recognition embedded

Choice of dataset: ClariQ (click to access it)

This is a form of conversational AI system and series, with the main aim of returning an appropriate answer in response to the users' requests. Some requests might be ambiguous and it is however much more challenging in dialogue settings. ClariQ dataset takes into account the following situation for dialogue settings:

- A user is asking an ambiguous question (where the ambiguous question is a question to which one can return > 1 possible answer);
- The system must identify that the question is ambiguous, and, instead of trying to answer it directly, ask a good clarifying question.

It comes with synthetic multi-turn conversations (up to three turns). **ClariQ** features approximately 18K single-turn conversations, as well as 1.8 million multi-turn conversations with 3929 questions.

Methodology:

a) **DATA PREPROCESSING**: The data in our dataset is in tsv form, so it will be easy to extract the information through pandas library into a dataframe for example.

b) **MACHINE LEARNING MODEL:** After some research, we found that "transformer" will be our ideal model because of its useful applications in natural language processing/translation. We also thought of using recurrent neural networks but we found that the transformer is better as it allows "parallelization", which will reduce the training time. On the other hand, we certainly have limited knowledge regarding transformers; hence, our challenge would be learning more about it and how to implement it.

c) EVALUATION METRIC: Based on the examples given in the deliverable document, we deem the suitable to be *BLEU score with a brevity penalty* because, even though the output is voice speech, there is essentially a text generated. However, we are waiting for our TPM's confirmation to make sure we are using the adequate metric for our model.

Application: We will design a user-friendly interface where the user can talk to the AI chatbot and run a multi-turn conversation (if needed). The AI bot will attempt to recognize their speech and answer accordingly. The user will hear the AI bot speaking to them by voicing its answer.

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