MeetingMinds: From Speech to Summary

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KEYWORDS

Text Summarization, Speech-to-Text, Query Answering, Information - Retrieval

1 INTRODUCTION

Our project aims to implement an information retrieval system for online meetings. We will be using a speech-to-text model to convert spoken words in meetings into written text, generate meeting transcripts, and further summarize the content to create meeting notes and action items. As an extension, we plan to utilize these meeting notes and transcripts as a private corpus for answering queries, potentially via Slack bots or APIs.

2 MOTIVATION

The motivation behind this project is to enhance productivity and collaboration in remote work settings. Online meetings have become an integral part of modern work and collaboration. However, keeping track of the discussions, decisions, and action items in these meetings can be challenging. By automating the process of generating meeting transcripts, notes, and action items, we aim to improve information retention, accessibility, and the overall effectiveness of online meetings. Additionally, creating a private corpus can facilitate quick and accurate responses to common questions, making team communication more efficient.

3 PLAN OF WORK

(1) **Week 1: Project Setup and Data Collection:** Set up development environments and gather online meeting audio recordings. Preprocess the audio data for training or search for some state-of-the-art speech-to-text models. The criteria here is to convert speech to text as quickly as possible in real-time.
(2) **Week 2-3: Speech-to-Text Implementation and Model Training:** Research on the various real-time speech-to-text algorithms and models and test its response time. Choose the best and quickest speech recognition method and start training the speech recognition model.
(3) **Week 4: Transcript Generation and pre-processing:** Implement a system to generate meeting transcripts from converted speech. Explore how to pre-process the generated transcript such that summarization is as accurate as possible later.
(4) **Week 5-6: Transcript Summarization:** Develop algorithms for summarizing meeting transcripts. Generate meeting notes and action items from the summaries.
(5) **Week 7-8: Extension - Query Answering:** Store meeting transcripts, notes, and action items as a private corpus. Implement query and response mechanisms (e.g., Slack bot, API) using the corpus.

4 DATA

In this project, we will be using 2 key datasets

(1) ***Speech to Text - [Librispeech ASR dataset [1]]*** - 1,000 hours of narrated audiobooks which has an audio input and narrated text output. We can use this to train a speech-to-text model.
(2) ***Text Summarization - [WikiHow dataset [2]]*** - 230,000 article and summary pairs extracted and constructed from an online knowledge base written by different human authors. Because the dataset contains an article and summary pair we could use it to train a supervised summarization model.

5 PROPOSED EVALUATION

- **BLEU(Bilingual Evaluation Understudy) [3]** - It quantifies the similarity by comparing n-grams, providing a valuable measure of how well a summarization model captures essential information.
- **ROUGE (Recall-Oriented Understanding for Gisting Evaluation) [4]** - Measures the recall, or the ability of a machine-generated summary to include all relevant information present in a set of reference summaries or human-generated content.
- **F-score** - Combines precision and recall into a single score, providing a balanced measure of a model's performance. In the context of text summarization, precision measures the accuracy of the generated summary, while recall assesses how well the summary captures all relevant information from the source text.

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