Project Overview: Sound Refine

Brain and Cognitive Society

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1 Mentors

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2 Motive:

Our final model is designed to process audio input contaminated with noise, removing the noise while transcribing the audio and potentially identifying the speaker. This functionality proves invaluable for tasks such as transcribing lectures or documenting unproductive meetings efficiently.

3 Problem Statement:

Our project involves Noise Cancellation and Audio Transcription. We aim to create a model that processes a mixed input of **clean speech** mixed with **background noise**, employing **machine learning algorithms** to effectively isolate and remove the noise, thereby reconstructing the **clean speech signal**. Subsequently, it transcribes this **purified speech** into a **textual form** in **Hinglish** language, to facilitate further analysis, understanding, or application in various domains such as communication, accessibility, and data-driven decision-making.

4 Project Details

The project involves exploration of practical applications of Deep Learning. The project focusses on mentees learning about Convolutional Neural Networks(CNNs), Artificial Neural Networks (ANNs), and Transformer Architectures.Additionally,mentees will delve into the theory and practical application of auditory processing techniques,including the exploration of relevant libraries. Key learning objectives include understanding CNN and Transformer Architectures, as well as mastering audio processing fundamentals. The mentees will be given resources and tasks related to it at the end of every week which they need to complete for the smooth conduction of the project.

5 Project Progress

5.1 Week 1

We learnt the basics of deep learning and python via introductory courses, lectures and doubt-clearing sessions. We also had a programming assignment that aimed to solve a classification problem using the learned concepts to further strengthen the Deep Learning concepts learnt in this week.

5.2 Week 2

We had multiple sessions on Audio Processing Fundamentals. A task was then provided to prepare a dataset of 1000 samples of noisy data by combining clean speech and noise.

5.3 Week 3

We had sessions on CNNs and Audio processing, both of which are integral to the project endgoal.