

DSAA PRELIMINARY REPORT

GROUP-51

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DIGITAL HEARING AIDS

Dataset Report:

- We'll need speech(audio) as input for this project.
- So we'll have a set of audio files as our input.
- We won't be needing a vast dataset of audio files as the aim of the project is to implement a device which can process any input audio given to the it.
- Instead we'll have few pre-recorded audio files to test its working
- We'll even have a record option to record the audio and convert it live
- To simulate real life situations we'll add Adaptive White Gaussian Noise (AWGN) to the input

Description of problem in terms of dataset(input):

In order for the impaired person to comprehend the audio, the input(audio) signal has to be transformed accordingly. The following the steps will be performed on it:

- [0)Addition of noise (AWGN) for simulation (won't be required in the final product)]
- 1)Noise Reduction Filter (using wavelets)
 - 2)Frequency Shaper (according to user's preference)
 - 3)Amplitude Modulation (to ensure the amplified signal will not exceed saturation power)

Initial Results based on existing algorithms:

- There are lot of existing algorithms and implementations of digital hearing aids used in the market which can produce similar results.
- We intend to improve these results in our DHA by utilizing the many audio processing functions and techniques offered in MATLAB to making it more superior than others

Analysis of Initial Results:

The newer Hearing Aids which were implemented using MATLAB are able to refine the sound signal (by applying operations such as noise reduction and improving speech signals) without distorting the sound quality. The digitalization of signal in MATLAB makes it possible to precisely analyze and filter the signals.