**Audio Summarization**

**Progress Report**

Over the course of time we have completed the following things:

- Introduction to audio

- Audio preprocessing

- conversion of audio wave from buffer to vector

- plotting the audio wave

- using Fast Fourier Transformation

- plotting the audio wave after FFT

- extracting time domain and frequency domain features such as zero crossing rate, maximum amplitude and energy of the signal

The detailed **Work Log** is provided below:

|  |  |  |
| --- | --- | --- |
| **Meet No.** | **Date** | **Work Done** |
|  |  |  |
| 1 | 10-09-2021 | Project Topic discussion with mentor |
|  |  |  |
| 2 | 23-09-2021 | Discussion on audio signal |
|  |  | Reading an Audio file using audioread |
|  |  | Analog-Digital conversion |
|  |  | Identification of Sample rate |
|  |  |  |
| 3 | 08-10-2021 | Plotting the audio wave using matplotlib |
|  |  | Discussion on max frequency and Nyquist Theorem |
|  |  | Discussion on Fast Fourier Transfromation |
|  |  | Discussion on Short Time Fourier Transformation |
|  |  |  |
| 4 | 18-10-2021 | Conversion of Time to Frequency domain using FFT |
|  |  | Plotting the transformed audio wave in frequency domain |
|  |  |  |
| 5 | 25-10-2021 | Discussion on Variance of f0 with gender |
|  |  | Discussion on Relation of amplitude and loudness |
|  |  | Discussion on Relation of frequency and pitch |
|  |  | Discussion on ZCR |
|  |  | Discussion on Energy |
|  |  |  |
| 6 | 02-11-2021 | Calculation of ZCR |
|  |  | Calculation of Energy |
|  |  | Correction on implementation of FFT |

**PO Mapping and Justification**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | PO 1 | PO  2 | PO  3 | PO  4 | PO  5 | PO  6 | PO  7 | PO  8 | PO  9 | PO  10 | PO  11 | PO  12 | PSO  1 | PSO  2 | PSO  3 |
| **Audio Summarization** | 2 | 3 | 2 | 2 | 3 | - | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

* **PO1-** Throughout this project we are applying the concepts of Physics and engineering in terms of data analysis and advanced machine learning algorithms.
* **PO2**- In this project we are analyzing and solving the problem of summarization of audio.
* **PO3**- A real world in-demand problem has been taken up and the solution for the same Is being developed.
* **PO4**- In this project we are using research based knowledge and analysis of audio files to develop a viable solution.
* **PO5**- In this project we are using advanced algorithms of Machine Learning and analysis in Python.
* **PO8**- Professional ethics are being followed as following the ethical principles and committing to professional ethics are upheld as sacrosanct.
* **PO9**- This is a team project and we are contributing to it individually as well as collectively.
* **PO10-** As a team we always discuss and put forward each other’s opinions and advance accordingly.
* **PO11**- The knowledge and understanding of management has been applied in our work.
* **PO12**- This project gives us the ability to engage ourselves in independent and lifelong learning and is keeping us updated with the latest technologies.
* **PS01**- Fundamental knowledge and programming aptitude has been applied at every step.
* **PSO2**- Requirements have been analyzed and prototype is being developed to meet industry standards.
* **PSO3**- This project gives us the ability to engage ourselves in independent and lifelong learning and is keeping us updated with the latest technologies and thus, will definitely help us improve ourselves in the industry.