19CCE281 Signal Processing Lab – Term End Project

Sound Analysis and Operations

Group 3 – Team 4

(Abstract Document)

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Abstract:

Audio signal processing is a subfield of signal processing that is concerned with the electronic manipulation of audio signals. The project, based on Signal Processing, employs sound as a signal and demonstrates various functionalities that can be performed on it. Further, it simulates complex real-world applications of sound wave/audio by assuming a simpler scenario. These functionalities are made possible with a convenient programming language Python and Spyder Integrated Development Environment (IDE).

The operations applied on sound waves are as follows:

1. Read a sound file.
2. Generate sound.
3. Simulate amplitude modulation.
4. Simulate frequency modulation.
5. Simulate frequency demodulation.
6. Record sound and do spectral analysis.
7. Design and analyze filters.
8. Remove noise from a noisy signal.
9. Create music using given notes.

Intensive algorithms are applied to audio signals, the representation of sound. Their frequencies range between 20 to 20,000 Hz, and this is the lower and upper limits of our ears. Analog signals occur in electrical signals, while digital signals occur in binary representations.

This process encompasses removing unwanted noise and balancing the time-frequency ranges by converting digital and analog signals. It focuses on computational methods for altering sounds. It removes or minimizes the overmodulation, echo, unwanted noise by applying various techniques to it.

Queries:

No queries.