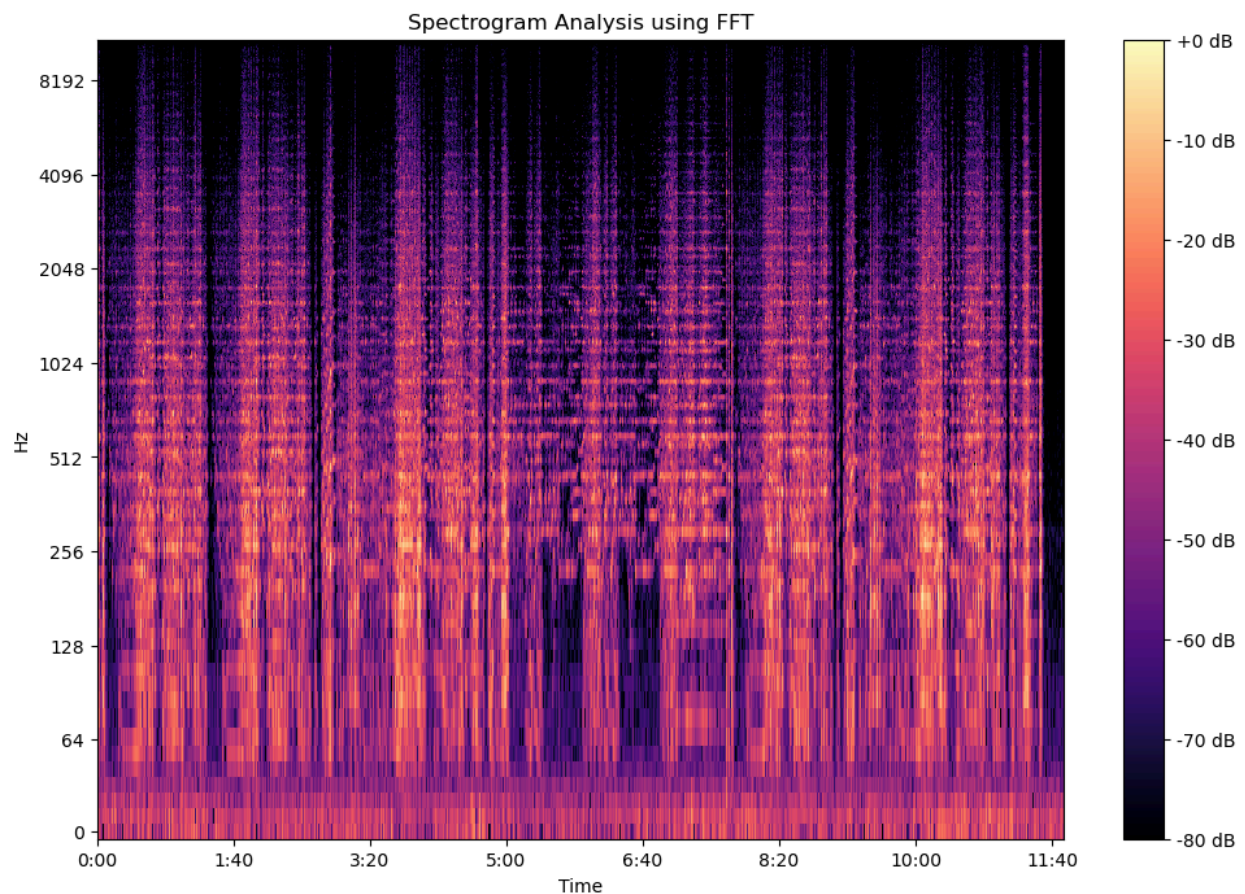


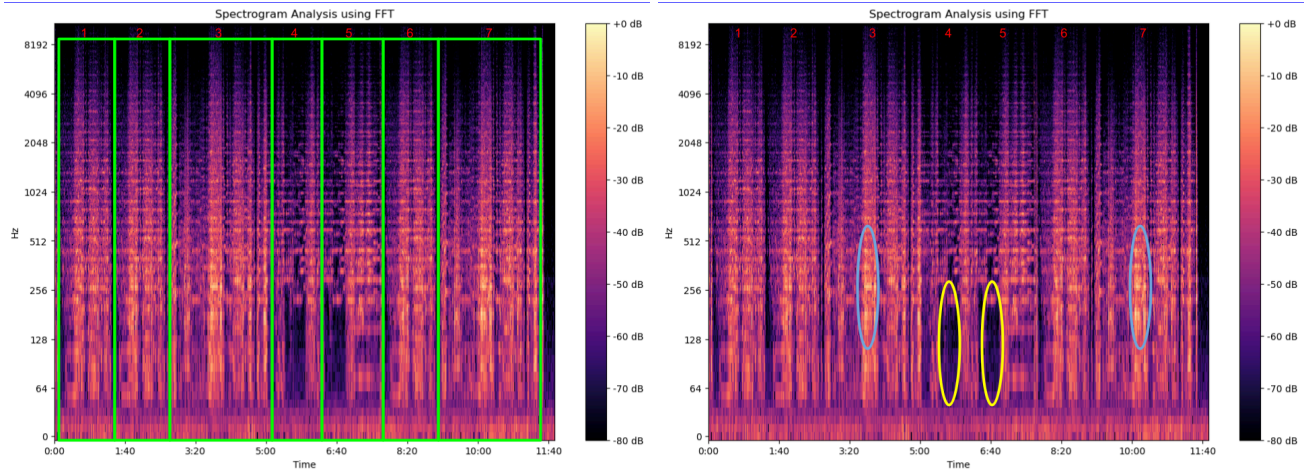
David Truong
01/31/2024

Spectrogram Analysis Report

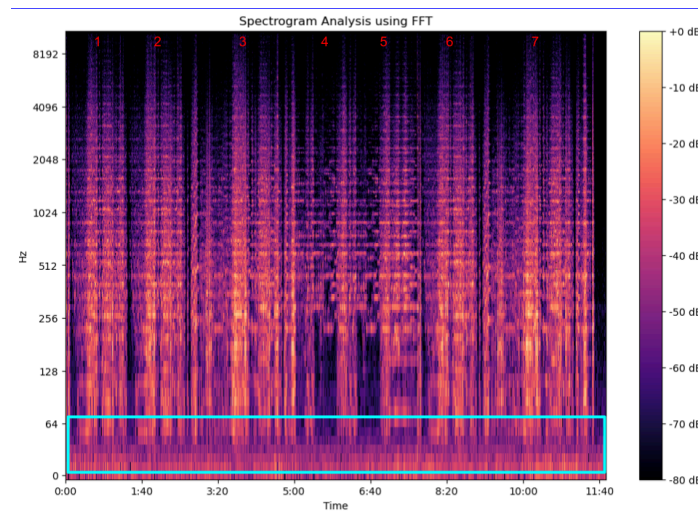
Upon preprocessing the audio data and transforming it from time domain to frequency domain, the resulting spectrogram is presented below.



Upon scrutinizing the provided audio data, it is observed that the frequency spectrum spans from 0 Hz to slightly exceeding 8192 Hz. A comprehensive analysis of the spectrogram reveals distinct temporal divisions, hereby labeled as sections 1 through 7, with corresponding time intervals: 1 (0:10-1:30), 2 (1:30 to 2:40), 3 (2:40, 5:05), 4 (5:05, 6:20), 5 (6:20, 7:50), 6 (7:50, 9:10), and 7 (9:10, 11:35). Notably, brief intervals of silence appear between these sections and a few seconds of silence at the conclusion of section 7, signaling the end of the audio.



An identifiable pattern emerges from the similarities among sections 1, 2, and 6, denoted as pattern type A. Similarly, sections 3 and 7 exhibit a congruent pattern, designated as type B, characterized by the highest amplitude at approximately 256 Hz. Conversely, sections 4 and 5 share commonalities and are categorized as pattern type C, marked by the lowest amplitude at approximately 128 Hz. The discerned sequence in the audio pattern follows the sequence: A, A, B, C, C, A, B.



Considering the musical nature of the auditory pattern, pattern type A can be likened to an ascent, as the frequency intensifies. Pattern B corresponds to the climax or the most intense segment of the music, while pattern C can be viewed as a descent, with the frequency diminishing in intensity.

The digital fingerprint produced for this audio file is “Audio Fingerprint: {'peak_frequencies': [5378.048780487805], 'peak_times': [11.95827664399093]}”. The digital fingerprint is a compact representation of an audio file extracted through features like peak frequency and time. It enables efficient comparisons within a large database similar to real-life fingerprints used for personal identification, the digital fingerprint serves as a unique identifier for audio files. By enhancing the fingerprint with additional feature extractions, its accuracy and efficiency can be further improved.