Audio Visualizer

SE 101 Lab Proposal • Hansson Lin, Thomas Kou

Description

An audio visualizer with a 24×12 array of LED lights acting as the “display”. Software will simultaneously play audio while analyzing the signal’s frequency spectrum. The magnitude of the signal at different frequencies will be sent to the audio visualizer, which is then responsible for displaying the data by lighting up the appropriate LEDs in the array.

Major Software Components

- Implement a simple user interface that selects an audio file to be played and visualized.
- Implement an audio playback system.
- Perform realtime audio frequency analysis based on the current audio being played.
- Create a system that relays the audio data to the visualizer.
- Program the visualizer to light up the appropriate LEDs in the display.

Prototype Plan

Our prototyping strategy will make use of *horizontal* and *experimental* prototypes.

- The project will involve ideas that neither of us are too familiar with, such as programming algorithms that analyze audio frequencies, meaning that it is likely that code will be experimented with and thrown away.
- There are numerous components at play in our project, meaning that integration will be a key challenge. A horizontal prototype strategy will ensure that our components will work together as intended as they are being developed.

Hardware Acquired / To Acquire

- Array of LEDs (approx. 288 lights)
- Hardware 2
- Hardware 3

Challenged Anticipated

- Learning how to analyze and generate an audio frequency spectrum based on a single audio signal. This will likely involve delving into more complex fields of math such as Fourier analysis.
- Challenge 2
- Challenge 3