

ECE 153B Final Project - LED Audio Spectrum Visualizer

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Overview:

We propose to create an audio spectrum visualizer for the LPC 4088 microcontroller using LEDs. The LEDs will display a certain color according to the corresponding frequency of the audio received from the in-line microphone on the microcontroller.

Peripherals:

1. 5-meter WS2812B LED strip (on project board)
2. In-line microphone

Software Designs:

The in-line microphone would be plugged into the microcontroller port to sample the incoming audio. We will then take the incoming audio frequency and perform a FFT signal processing. The results will then be binned and displayed using the corresponding LED strips. The LED strips will display different colors and height according to how prominent the frequency is and how intense the audio is being received.

Goals:

1. Receive and transmit data at the fastest possible rate with minimum loss
2. Cut down the 5-meter LED strip into smaller strips for better visual representation
3. Display the changing frequencies in real-time onto the LED strips

Group Responsibilities:

Ethan will be in charge of developing the software that corresponds with the binning and displaying the audio frequency to the LEDs. Raymond is in charge of all the peripherals and creating the FFT.