LED Light Show – ECE 153B Project

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Overview

Our project proposal consists of taking in audio file input with the LPCXPresso 1115 and pass the audio input to an external peripheral: an FFT chip. The FFT chip will act as the intermediate step between the audio file input and the corresponding LED flashing on the board. Our application will allow for any input audio file to be converted into an LED light show on the board.

Peripherals

1. 7 LEDs on the LPC Board
2. Graphic Equalizer Display Chip: MSGEQ7 (https://www.sparkfun.com/products/10468)

Software Design

The idea of the software is rather simple. The audio file (and corresponding audio waves) will be read in by the LPC, and then be sent to the MSGEQ7 chip. The MSGEQ7 chip will perform an FFT on the audio file and returns the corresponding frequency "bins" in real-time. From there, the bins will then be scaled and will be transferred to each LED pin on the board (the 7 through-hole LEDs), and each LED will either turn on/off and will vary in intensity to follow the audio file.

Output

Each of the LEDs on the board will correspond to a frequency bin that the MSGEQ7 chip outputs: 63Hz, 160Hz, 400Hz, 1kHz, 2.5kHz, 6.25kHz, and 16kHz. We hope that the LEDs will be able to react in real-time with enough speed in order to keep up with the music. This will allow us to play/change music on-demand.

Group Responsibilities

This project is geared towards both people working equally on each part of the project. However, Ashlynn is more responsible for finding all of the information on the MSGEQ7 and learning how to integrate the 1115 with the MSGEQ7. Bryan will be more geared towards learning how the MSGEQ7 interacts on the software side, and learning how to control the LEDs in correspondence with the output of the MSGEQ7 with PWM.