Project Name: Sound Reactive T-Shirt

Mohsiur Rahman - mohsiurr - 50093822

Abstract

A microphone picks up the music playing in the background with the LED strips attached to the cloth material reacting to the beats of the music being played using Adafruits Arduino Compatible Wearables Platform, Flora which will be handing the processing.

Components: Hardware, software, operating systems (including versions), special algorithms and data structures, approaches used. In other words, a solution statement.

- **Hardware**
  - *Adafruit Flora* - Adafruit's Arduino-Compatible Wearables Platform
  - *Electret Microphone Amplifier* - Microphone for listening/recording the song
  - *Adafruit NeoPixel Digital RGB LED* - LED Strip which will be attached to the cloth and connected to the Flora.
  - Soldering Iron
  - Ribbon Cables
- **Software**
  - Programming Language - C/C++
  - Arduino 1.6.x IDE
- **Algorithms**
  - Fast Fourier Transform to find peak values of songs

Use cases: Who will use your system? What are some common applications and uses?

- **Target Demographic**
  - Concert Goers
  - Music Enthusiasts
- **Common Applications**
  - If not used on cloth material, it can be used to detect sounds in a room and output it with a light, which can then be used to send alerts as well.

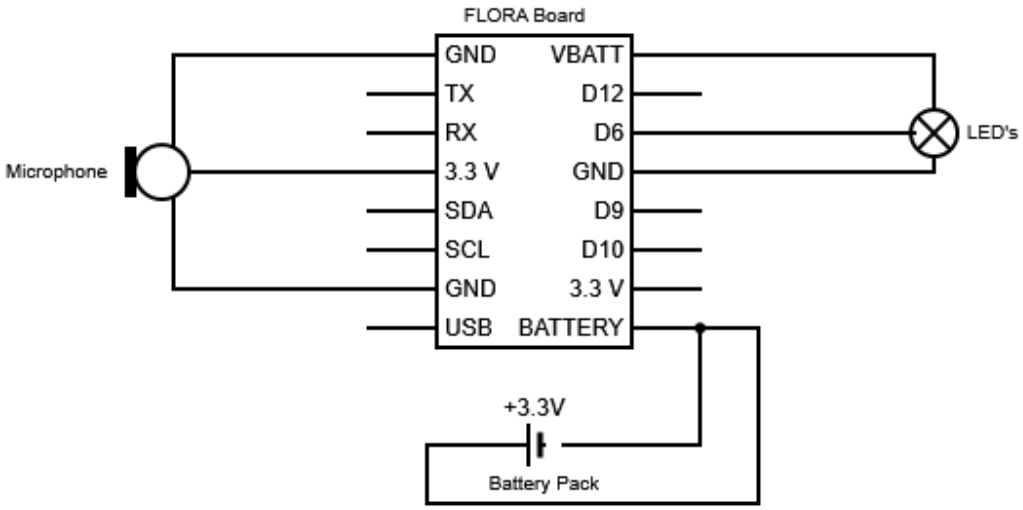
Significant contributions

- Dancers and Choreographers, can use this make a dance routine which can react to pre-recorded music and tell a story with the music.

Coolness and Novelty:

- Sound Reactive Clothes!! That's pretty cool honestly, and with the right music and dance techniques you would stand out of the crowd.

Circuit Diagrams



Inputs

- **Analog - Microphone connected to pin A9**
- **Digital - LED's connected to pin D6**

Libraries Used

- **Adafruit_NeoPixel.h (https://github.com/adafruit/Adafruit_NeoPixel)**
- **math.h**

Challenges

- **A couple of challenges arose during the project**
    - Soldering small pieces of wire to achieve the shape of LED's.
    - Debugging Mic readings to find peak values.
    - Realizing setting brightness of LED's can risk of crashing when running on a 3.7 V battery, can increase brightness with more voltage.

Pictures