Project Check In

Team Name: BTripleJ

CIS 350 / June 2025

Presented by

Blake Collins

Joey Shotts

Josh Dobbs

Jason Gray-Moore

Blake Collins

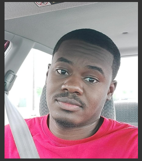
CS major with EE background.
Have experience with:
Microcontrollers
Python, and C. I worked with the microcontroller on this project

Joey Shotts

I'm a 4th year Computer Engineering Major. My fun fact is that I work in the Technology Showcase in the library. I have been working in Controls at JR Automation this past year.

Josh Dobbs

I'm a junior in Computer Science. I specialize in working in python and UI. I develop the main GUI of this project.



Jason Gray-Moore

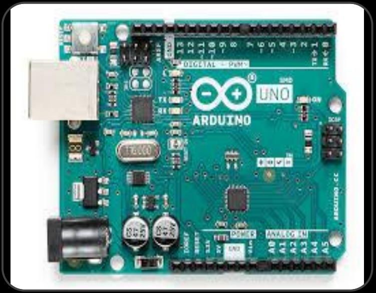
I am Computer Engineering Major. I write software for Savant Automation AGVS. I worked with the microcontroller for this project.

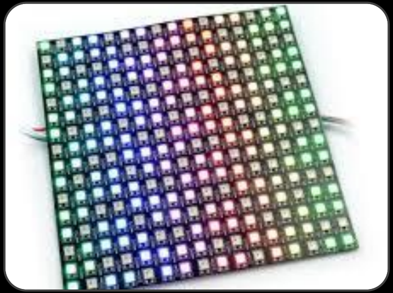
Our Project

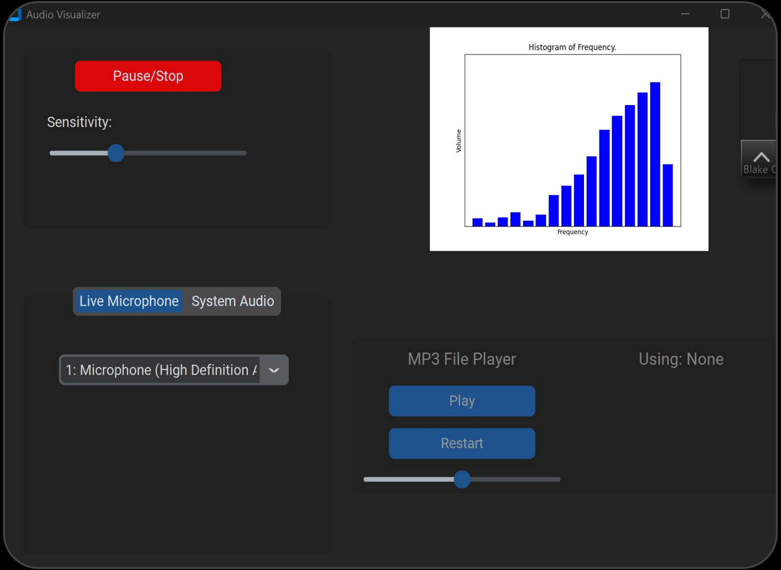
Arduino Audio Visualizer with Python GUI

We used Custom Tkinter for this project. It allowed for simple grid system GUI creation. Widgets are easily added to a grid in which you can interact with them to adjust how the LED will be displayed. The GUI is simple and easy to use:

- Play and Pause and Sensitivity in the top left for controls directly to the output
- Live Mic and System Audio options for where the input comes from
- An MP3 player for selecting mp3 files to use
- And a graph visualizer to see real input






Audio Visualizer

1: Microphone (High Definition /

Using: None

Our Project

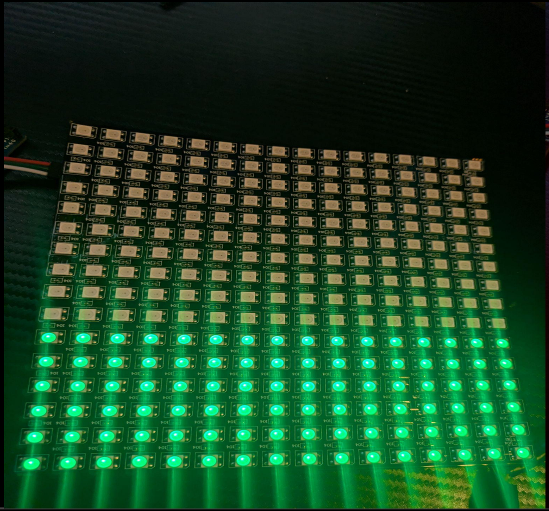
Arduino Display

After the audio or microphone input is analyzed, the data is transferred over serial to the arduino. We use the FastLED library to be handled setting each LED according.

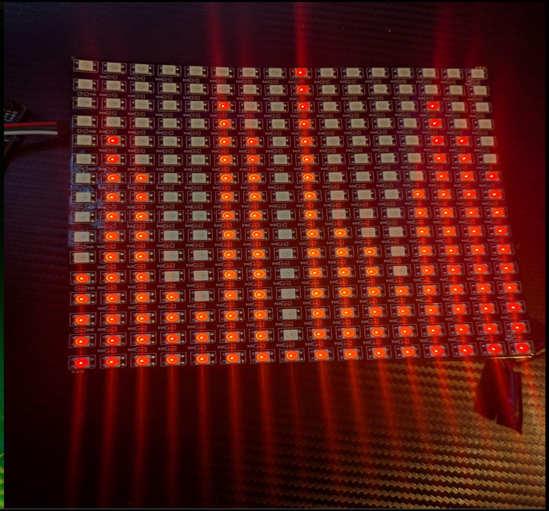
- Use CHSV to determine color for LED
- Count the number of commas to know if Amplitude or Frequency

Example Inputs

110,40



0,10,12,14,9,4,6,7,16,1,12,14,3,4,10,12,5



How it works

Custom Tkinter

This is the library we used to create the python GUI. It is based off of the popular Tkinter Library and is a simple way to create a functional GUI.

Audio Processing

We are using the library sounddevice to stream audio from a variety of sources. We then are using numpy to process the data in real time gathering the max volume and a collection of frequency magnitudes.

Comms

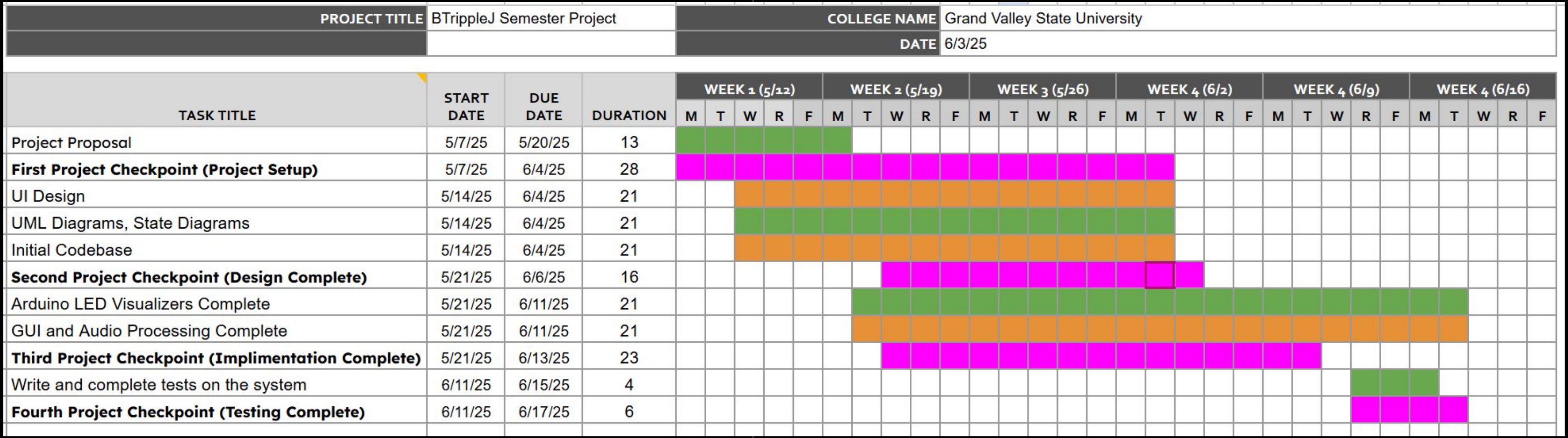
Sending data over Serial to the Arduino.We are using commas to separate each input, and a new line indicates that the input is complete. First input would be the Color using CHSV followed by the amplitude or the frequency.

Arduino

parse data from Serial and determine what mode and color to set the LEDs. With FastLED library we display frequency or amplitude of the audio.

Project Timeline

We are using a GANTT chart to keep track of our project. So far we have been keeping up with our timeline.



PROJECT TITLE	BTrippleJ Semester Project	COLLEGE NAME	Grand Valley State University
		DATE	6/3/25

TASK TITLE	START DATE	DUE DATE	DURATION	WEEK 1 (5/12)					WEEK 2 (5/19)					WEEK 3 (5/26)					WEEK 4 (6/2)					WEEK 4 (6/9)					WEEK 4 (6/16)				
				M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F
Project Proposal	5/7/25	5/20/25	13	🟩	🟩	🟩	🟩	🟩	🟩																								
First Project Checkpoint (Project Setup)	5/7/25	6/4/25	28	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪													
UI Design	5/14/25	6/4/25	21			🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧													
UML Diagrams, State Diagrams	5/14/25	6/4/25	21			🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩													
Initial Codebase	5/14/25	6/4/25	21			🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧													
Second Project Checkpoint (Design Complete)	5/21/25	6/6/25	16								🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪												
Arduino LED Visualizers Complete	5/21/25	6/11/25	21							🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩			
GUI and Audio Processing Complete	5/21/25	6/11/25	21							🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧			
Third Project Checkpoint (Implimentation Complete)	5/21/25	6/13/25	23								🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪	🟪								
Write and complete tests on the system	6/11/25	6/15/25	4																								🟩	🟩	🟩				
Fourth Project Checkpoint (Testing Complete)	6/11/25	6/17/25	6																								🟪	🟪	🟪	🟪			

Overall Progress

1

Specs and Proposals

It was good to all agree on the project proposal. We then planned out our ideas and specs for the system

5/7 - 5/20

2

Initial steps and familiarity

We needed to get familiar with the work we'd be writing for the project. Codebases and Hardware

5/14 - 6/4

3

Making the bulk of it

All of the project is made from scratch, setting up the fundamental basics of the project was needed before trying to implement the little things

5/21 - Present

4

Tweak the small remainders

We plan on adding some minor details as well as needing time for functionalities that may break along the way. It's good to go back and test

Goal: 6/11

5

Finalize the project

Wrap up the final bits of the project and checking all that is asked for from the project requirements.

Goal: 6/17

Our values

Next Major Steps

1	2	3
Be able to send all Data to the Arduino over serial from python script	Complete test plan and verify everything is working correctly	Merge all code to one branch

Look at our sick demo...

Thank you

Ready for what's next?

Let's talk

Any Questions?

B Triple J

Josh, Joey, Blake, Jason