

Visually Reactive Tech-Wear

By Jay Gurung

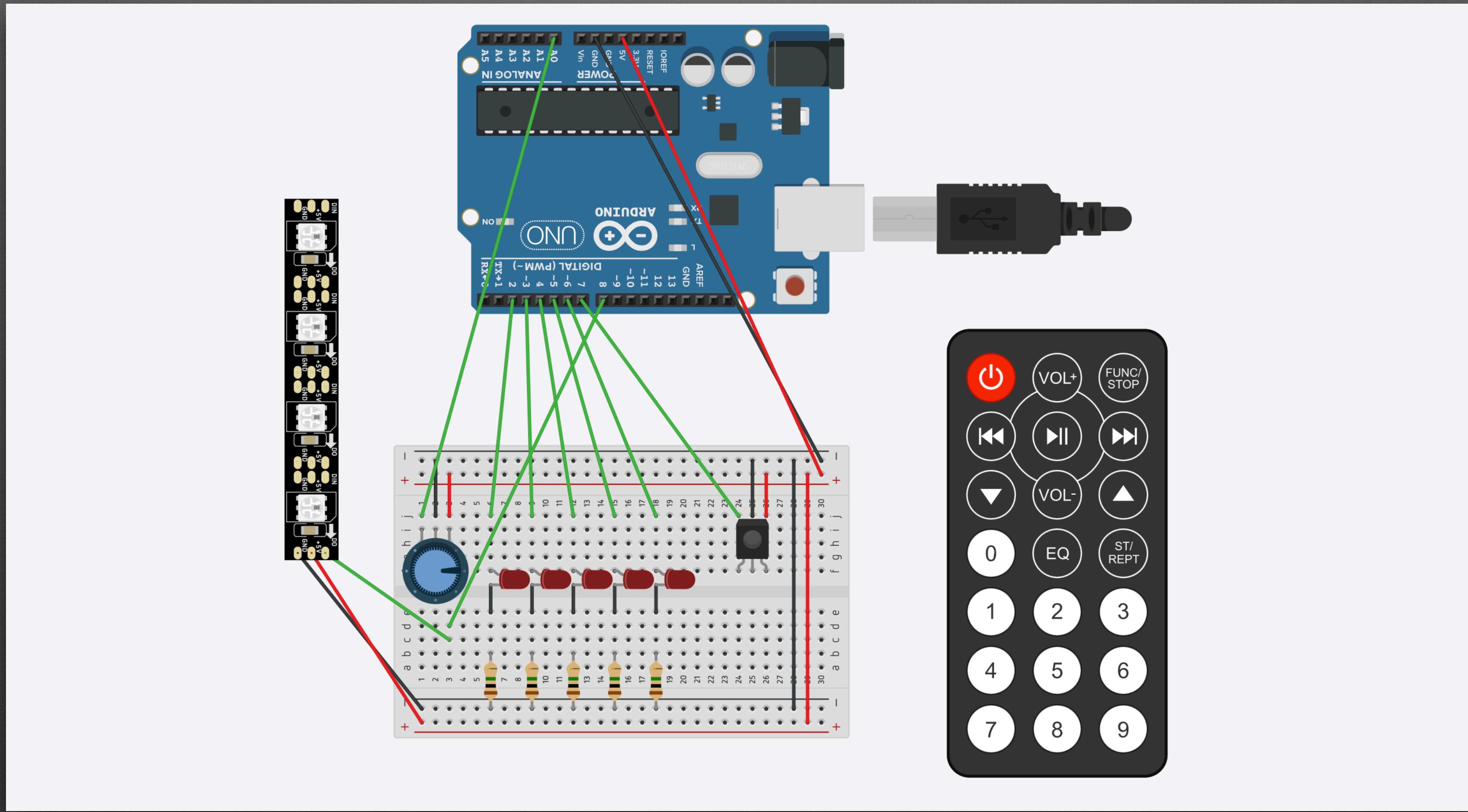
Culmination Project Proposal

What It Does:

- Reacts to real-time audio input from a microphone.
- Displays vibrant, dynamic animations on addressable RGB LEDs.
- Features different lighting modes triggered via an IR remote control.
- Random color mode and brightness adjustments based on sound intensity.

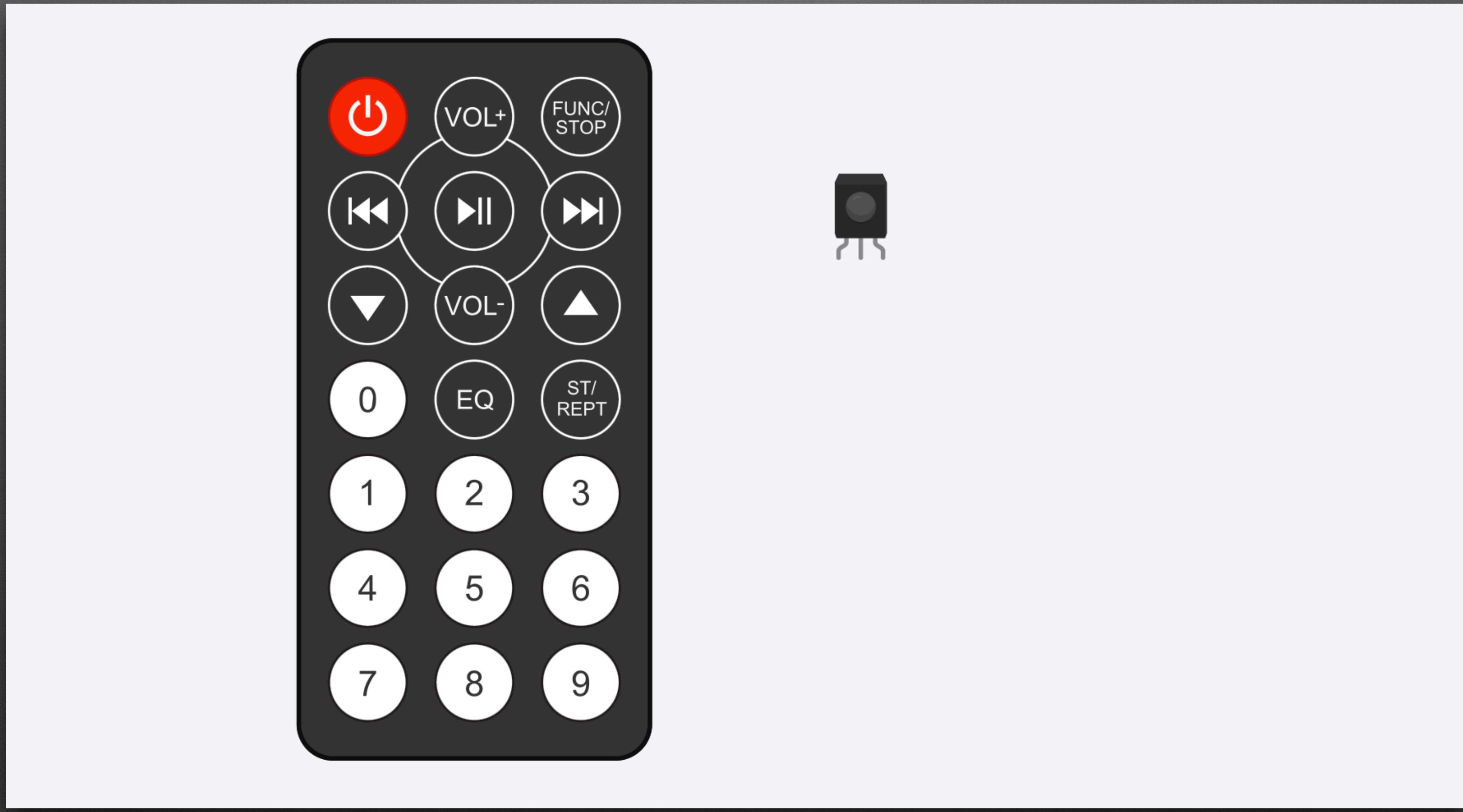
Key Highlights

- **Sound-Responsive LEDs:** LEDs brighten or dim based on audio input levels.
- **Custom Animations:** Cylon, Rainbow, and random color effects.
- **Remote Control:** Toggle between modes effortlessly.
- **Visual Impact:** Perfect for showcasing interactivity and real-time effects.



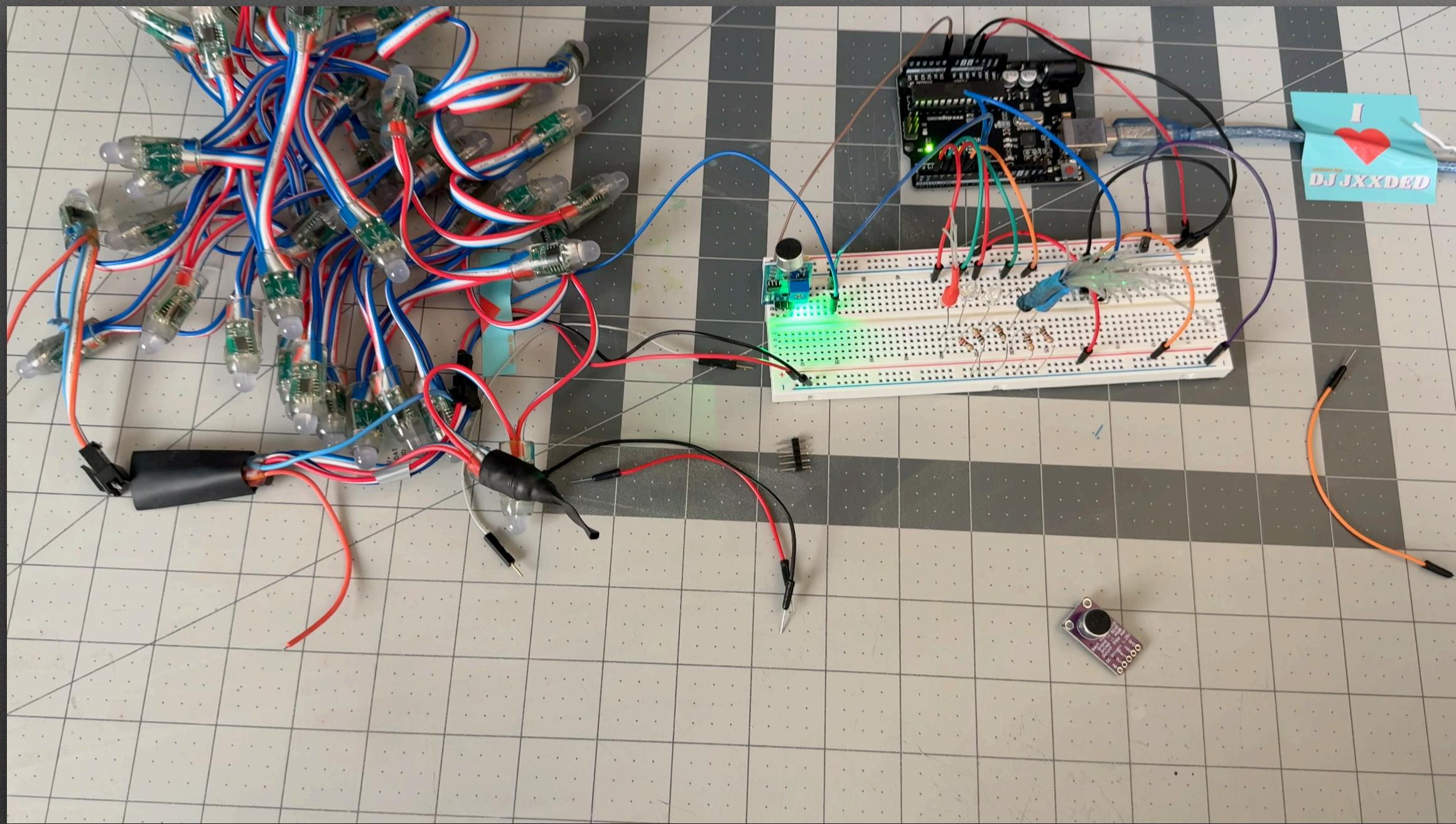
Sketch

Mic Module is represented by a potentiometer.
LED are placed as indicators which will also be attached to the optic fibers.



Controller For Switching States

Initially I had planned to use a potentiometer knob that would switch states. I found using IR Remote and Receiver components is more effective.

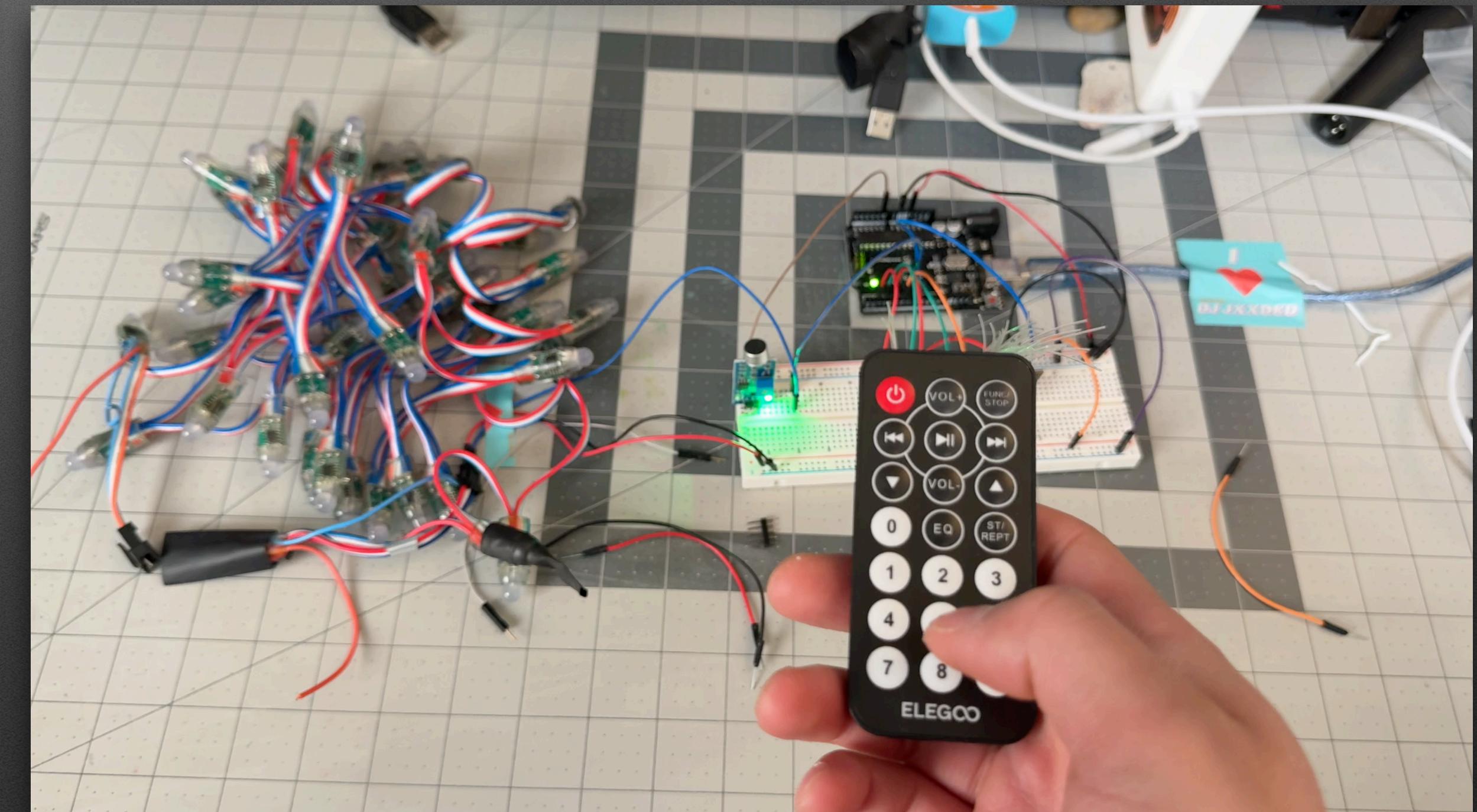


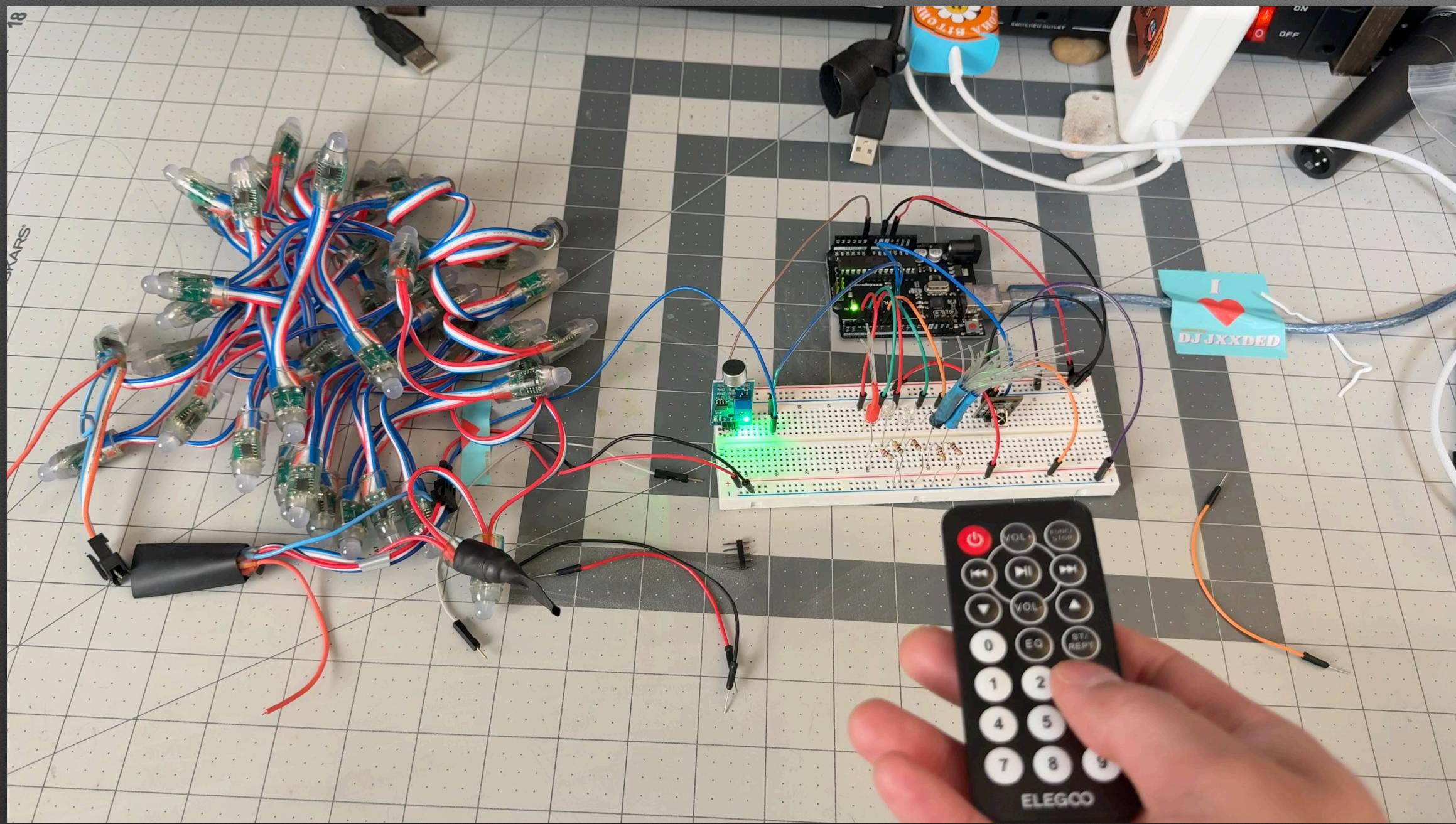
Mode 1:

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Displays vibrant colors that transition between different color values.

A specific color (blue) cycles from 1st to the nth led in group of 10.



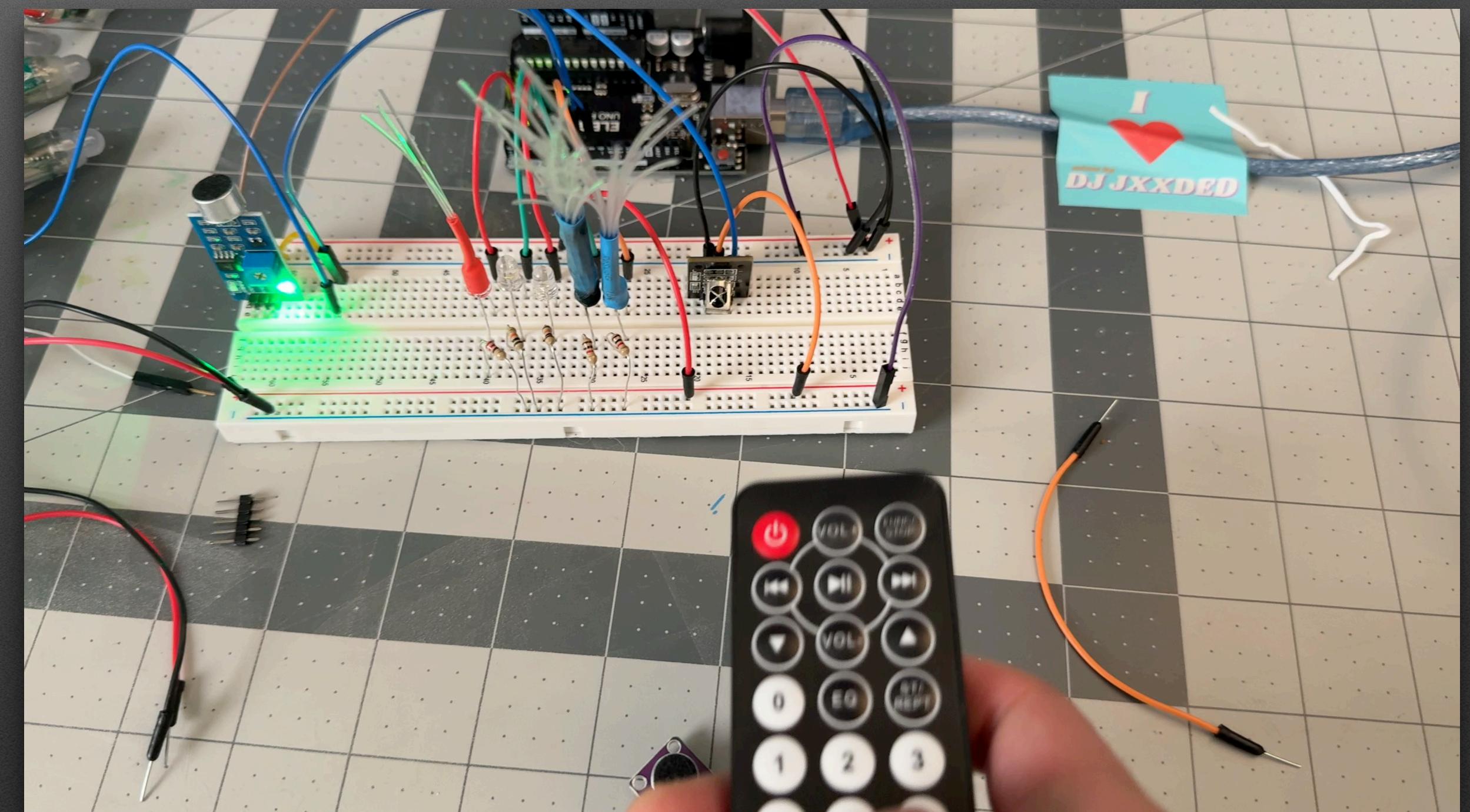


Mode 3, 4 and 0:

Optical fabric that are attached to the
LEDs light up. 0 turns off all modes.

Mode 3:

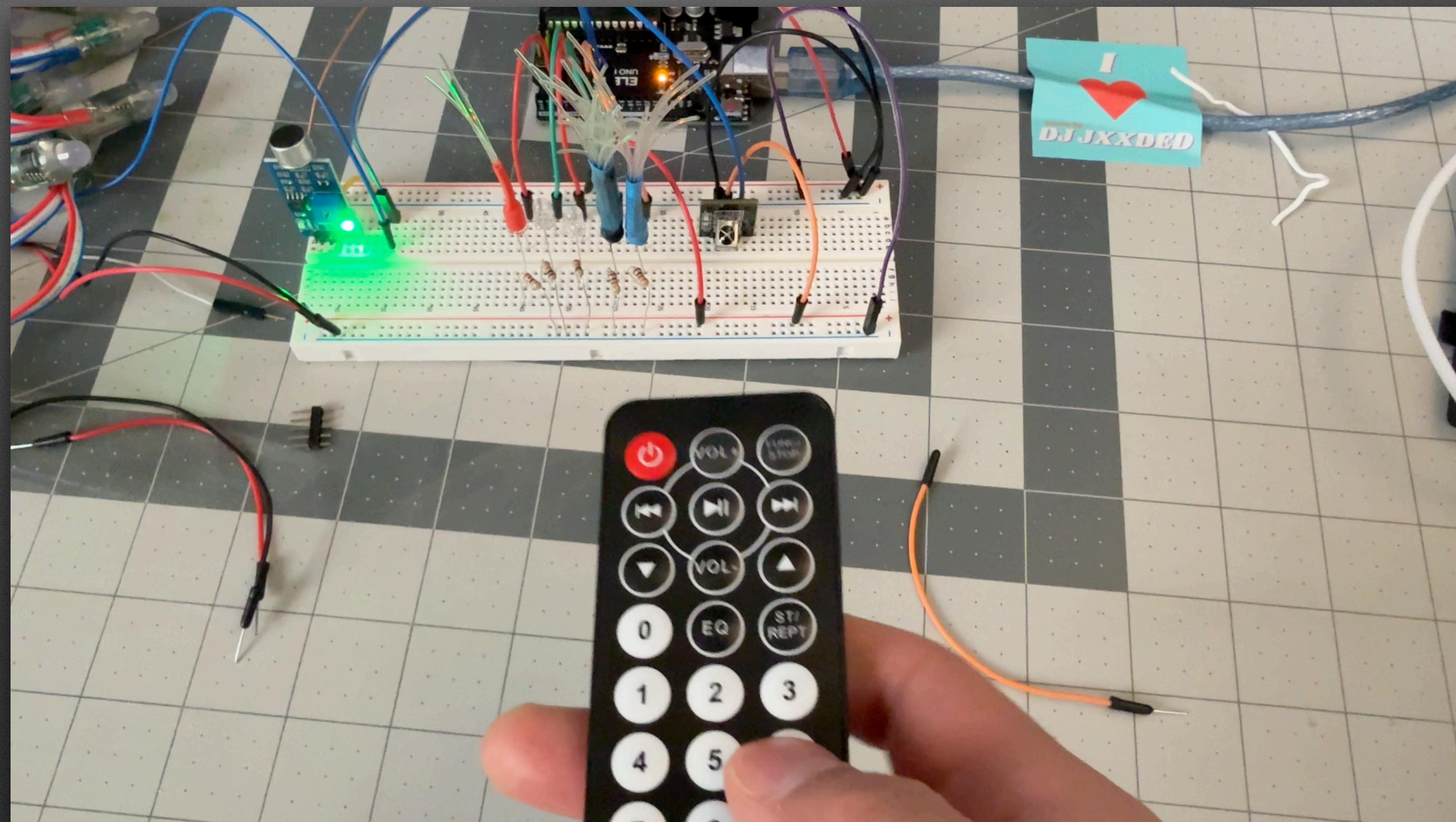
Random Color are generated and reacts to
audio input from the microphone module.



Mode 6:

All LED which will have optical fibre attached

will react to the audio all together.



Motivation

- I wanted to create something that I could implement in my stage performances.
- Create a wearable technology that will help other artists stand out.
- A challenge to make something practical using tools I learned in school.

Tools and Resources

- Arduino Components from Adafruit and Amazon
- Coding in Arduino IDE
- Resources and Examples from [fastLED webpage](#), arduinolDE examples, arduino community page, as well as YouTube.

Required Areas of Improvement

- Further Understanding of ArduinoFFT Library in order to get the microphone to properly read frequencies.
- Textile department
- Research on other microcontroller to see if size can be minimized.
- Although the project is working, something I find that mic module does not behave as expected. Sometimes the mic is too sensitive. Need to figure out how to make it more consistent.

Spring 2025 Timeline

- Week 0: Taking faculty feedback and project Update
- Week 1: Build an optimized wiring to connect the Arduino or Build a custom PCB
- Week 2: Build 3d jacket to hold the microcontroller
- Week 3: Meet faculty in textile department for further considerations.
- Weeks 4-5: Project update presentations for faculty panel (25-30% completion)
- Week 6: Have the electronics fitted into a jacket.
- Week 7: RND on the prototype for further improvements.
- Week 8: Work on further optimizing the code.
- Weeks 9-10: Culmination project 85-95% complete + faculty panel presentation
- Week 11-12: Final edits on the code, finalizing the project

Obstacles

- Learning syntaxes, functions and features of multiple Arduino libraries that are required for the project.
- Optimizing the barebones prototype.
- MAX9814 mic module not behaving as I wanted, needs more RND as it has more capabilities than LM393 which I am currently using.

THE END

THANK YOU