IM3080 Design and Innovation Project (AY2022/23 Semester 1)
Individual Report

Name: Aguilon Deryl Trinidad

Group No: Group 7

Project Title: Floweresent

Contributions to the Project (1 page)

Handled prototyping Lights, base system, and final coding for the final piece.

Initially I designed the system to use an ultrasonic sensor, to detect if an object was in front of the circuit, 74HC595 8-bit shift register to expand the number of output ports available to us on the Arduino Uno and RGB LEDs.

Prototyped the circuit on Tinker CAD while waiting for our Arduinos, it allowed us to test whether the logic would work. Initially used RGB LEDs and a shift register as I'm more familiar with them.

Upon testing, I realized using Addressable LED Strips would be more streamlined and cost effective. The task of learning code for the LED strips was given to my partner Heng Ying Qi.

I made up a mockup of the final system. It used 1x Arduino Uno, 1x ultrasonic sensor, 1x LED strip, and 1x piezo buzzer.

I discovered Arduino's limitation in not being able to run multiple functions parallel to each other and thus causing the lights to freeze whenever a sound needed to be played.

To solve the issues, I decided to split the system into 2 Arduinos making a Master-Slave system. This way the playing of Audio would not cause the lights to freeze.

In this time, we also decided to change from using and Ultrasonic sensor to 3 capacitive pressure sensors.

For the final piece, I handed Soldering 1m wires to every pan on 40 LED of LED strips. I handled the wiring of all the LEDs together and making channels in the base to house the wires

Finally, I combined the code for the LED strip and the pressure sensors into the Master Arduino and the code for the audio effects and background music into the Slave Arduino.

With the help of my teammates, we troubleshot the system as we encounter errors due to combining the codes together wrongly.

Reflection on Learning Outcome Attainment

Reflect on your experience during your project and the achievements you have relating to at least two of the points below:

(a) Engineering knowledge
(b) Problem Analysis
(c) Investigation
(d) Design/development of Solutions
(e) Modern Tool Usage
(f) The Engineer and Society
(g) Environment and Sustainability
(h) Ethics
(i) Individual and Team Work
(j) Communication
(k) Project Management and Finance
(l) Lifelong Learning

Point 1: Design/development of Solutions

As mentioned above I handed most of the hardware work of this project. Admittedly it has been a while since I last worked with an Arduino. As such I was rather rusty in making it work. As such I made a choice to start things off slowly at first and use components, I already knew how to use like an RGB LED and shift registers. Later on once I realized my method was inefficient I agreed with my team mates to change to using LED strips, something I have not used before.

Point 2: _____State the area_____

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