Adam Grzelewski
Kristina Mason
Zhenglun Yang

3/10/2022

ECE 342

Project Summary

The original design problem was to create a system that would imitate the turn signals from a car, but implemented onto a bike. This would allow one to signal left or right turns, as well as when one applies the brakes by increasing the brightness of the brake lights. We approached this project by planning out how the system would be connected to the other posible parts in the system and how we would go about accomplishing the problems set in place by the customer. Next, we started to implement some pieces of code that would demonstrate how the Arduino would communicate with the elements that we planned to use such as which libraries to use in order to successfully program the LED strip and get useful information from the accelerometer and gyroscope. Once we knew that each element in our system worked and we figured out how the libraries communicated with these elements, we moved onto programming the heart of our system, designing the enclosure for our system using Fusion360, and making the PCB for our system using Eagle. We initially planned to use a on-off-on toggle switch to act as the turn signal switch, but because of the lack of time we had remaining at this point, we decided to use 2 momentary push buttons instead since we had more experience with push buttons and we knew we could implement them very quickly. During the final building process where we soldered all the needed pieces to the PCB and put the enclosure together, we burned and damaged 2 push buttons, which made us rush to get replacement buttons from a nearby store. The project timeline consisted of 8 weeks where we were working on our project. Week 1 was devoted to finding what project we all wanted to do and what groups to be put in, week 10 was the expo week where system verification check off was last week, and week 11 was irrelevant because we had no final exam. Week 2 was focused on block diagrams and interface definitions. Week 3 was a continuation of week 2 including collecting the materials to build our system. Week 4 focused on collecting materials. Week 5 started the beginning of building our system prototype. Week 6 started the official testing of the system prototype. Week 7 was a repeat of week 6. Week 8 focused on designing the enclosure. Week 9 was finalizing the project and assembling all of the blocks into the enclosure and integrating blocks into the overall system. Some key lessons we learned from doing this project was having the lack of foresight to see what switches, bike, and light fixtures we would use for our project, which led to us having to make quick changes in order to accommodate for these sudden changes in our system.