Week 5:

Date: 09/23/2021

Total hours: 10

Description of Design Efforts:

This was the slowest week I have had personally. I was sick Tuesday/Wednesday so I could not attend my group's meet up times. This was difficult for me to get work done on my own. As the schematic guy, I just kept messing around on KiCAD and gave everything a footprint. It was a good thing that I did that because the billing material list called for everything on the schematic plus our bigger peripherals (camera, projector, etc.). The process was very quick as there is an option to export a billing of material list straight from the schematic, this saved me a lot of time.

- KiCAD

As I mentioned, the schematic has only changed in terms of additional footprints. Other than that, it is awaiting approval for ordering. I would have shown the schematic for the main lab (if I wasn't sick), but I will show it next main lab along with the PCB schematic. I don't know what the best way to go about creating the PCB tracks. Are multiple pads/vias more efficient than longer tracks? Should I use an auto-router? I have many questions about KiCAD's software moving from schematic to PCB design.

- Carpentry

The rig is mounted! The camera along with the projector is currently located on the ceiling of the 477 lab. At first, it was a safety hazard to dangle a projector above our heads as we worked, but now, it blends in with all the exposed piping the ECE building has to offer anyone that looks up. We have 3 cables that need to be attached to the rig: VGA, power cable, and USB. Power and VGA for the projector and the USB for the camera. It is a little messy but nothing some heat shrink tubing won't fix.

Fig. 1: Projector/Camera rig suspended by the piping in the ceiling

We also painted the table. We did this just for prototyping purposes as we do not expect the customer to do so for their table. The table's lines are painted black and the table itself is going to be white. Right now it is greenish-white as we ran out of white spray paint. Painting the table white will allow us to save some of the image projected from the table. Since the lab is very bright with all the lights on and the table surface is green. The highlights and shadows of the table are going to be lost pretty easily in this environment.

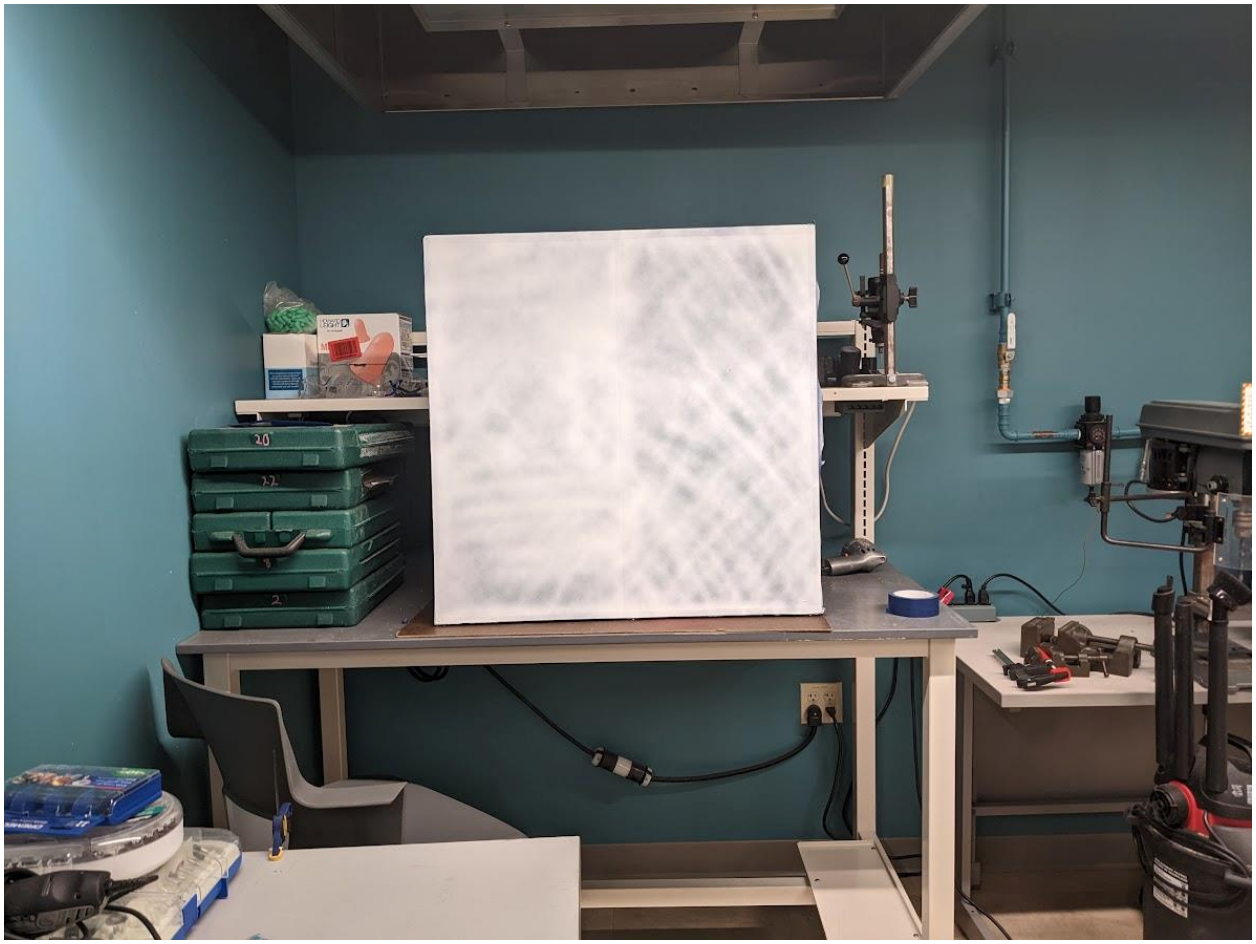

Fig. 2: Table being converted to white to better reflect projector image

- Ball Tracking Progress

We are still using the depth sensor, even though it was highly advised to simply track the color of the ball, but we have made progress. We applied a filter on the camera to only capture objects within a range in distance. For example, we can capture objects between 4-5 ft of the camera, which will be useful for our minigames. This will also allow us to capture object above the surface of the table without capture the table itself and 2-3 feet above the table. The biggest thing we have to do now is to capture the ball and make sure that paddles do not trigger the ball capture algorithm.

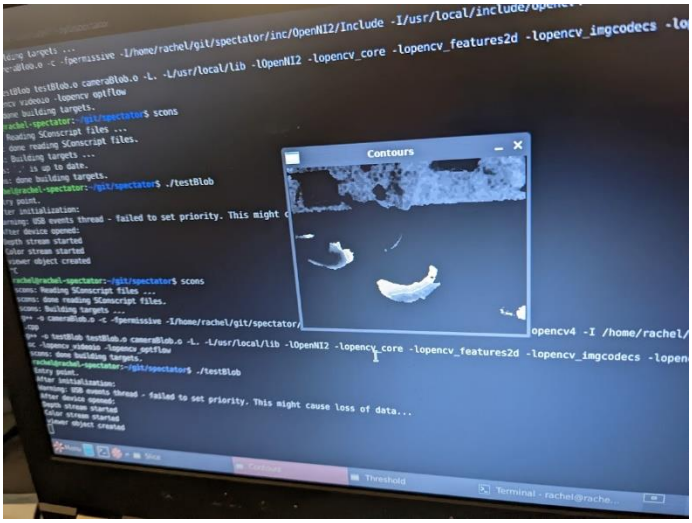

Fig. 3: Filtered camera feed, you can only see the table and 2 feet above it. The camera is not capturing our heads, but it is our shirts

- Next week

I know I have said this many of times. I will have a ready PCB on Wednesday to show to Rohan (TA), Dr Walters, and Joe. This will be the main goal of mine for the start of the week. Besides that, I will switch to ordering parts and helping with the OpenCV things. Maybe I will start working on color mapping in case depth mapping fails.