

Individual Lab Report 6

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Team G – Bob's builders

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Individual Work:

For this week, I did three things. The first thing I did was assembling parts for part of the wire cutter subsystem. There were tons of issues that happened when we connected parts together for the flux and wire placer. So everyone ended up pitching in. The second thing I did was to get the vision processing running on my computer. Due to raspberry pi issue explained in the Challenge and issues section, we decided to use my computer to do all the processing. It gave an even better performance than the raspberry pi and could accurately detect all 4 different image orientations. But it introduces minor challenges/issues that will be discussed below. The figure of the vision processing demo is shown on figure 1. Finally, the third thing I did was to modify the GUI. Our current project incorporates more than 5 motors while our GUI could only control three different motors. Now, the GUI can control 10 motors of each type(servo, DC motor, and Stepper Motor. This was easily implemented with a counter from 0 to 9 which accesses the xth motor of a type. Picture of the new GUI will be presented in figure 2. I probably could have done more but I had more than three meetings in the same day that prevented me from helping further.

Challenges / Issues:

One issue I experience during the lab was the fallout of the raspberry pi. The raspberry pi started to crash unexpectedly, which slowed down the debugging time for the slow vision processing program we had. Upon specified debugging, Eric found that it takes more than one second to send a character from the pi to the arduino. Normally, it should have taken less than 100 microseconds. This inevitably forced us to use my computer instead because of time constraints. I took part in running the playstation EYE in my computer to see if it is a problem with the hardware itself. Luckily, It worked fine. If it was the other way, we would had to replace the camera and that would take a long time.

Another issue was getting it to run on my computer. I didn't know how to do the task in windows. So I decided to install linux on my computer. Short story, I installed with a corrupted usb slot and had to reinstall it 5 times to actually get it running. After doing that, installing opencv worked perfectly, and the vision program worked perfectly. Another problem it caused is that if I wanted to get the GUI or the Vision running, I had to boot up the corresponding OS to run the program. Basically, I need Windows to run the GUI and I need linux to run the Vision. The short term solution to this problem is to get qt running on linux, which will be part of my future plan.

The thid issue I experience was an unexpected bug in my final sketch code for the arduino. It turns out that when we initialize an array of size 0 on the arduino, the arduino treats it as an array of size 1. So the arduino cannot independently ignore code involving arrays of size 0. This just means that my code will only properly run when we have the arduino mega with all three types of motors connected. The arduino mega hasn't arrived yet. So it will be almost impossible to debug the code. Another issue found was that the arduino mega would only provide 5 interrupt pins to use. Since each DC encoder uses two interrupt

pins, we will only be able to use 2 DC motor encoders for our project. We already have three installed. So we have to find alternatives to using encoders for the remaining DC motors.

Team Work:

Michael O'Connor and Christian Heaney-Secord worked on assembling more of the flux and wire placer. They made all the parts necessary to install all the parts needed in this demo. Eric mainly help in assembling the pieces together and assembling the stand for the playstation EYE. This doesn't sound much on paper, but it took almost two days to do.

Future Plans:

Hopefully, the arduino mega arrives so that I can work debugging code that hasn't been debugged in weeks. I plan to shift all my computer related programs to the linux distribution for better ease of use. In addition, I plan to help out assembling and integrating parts that have been built already but need improvements.

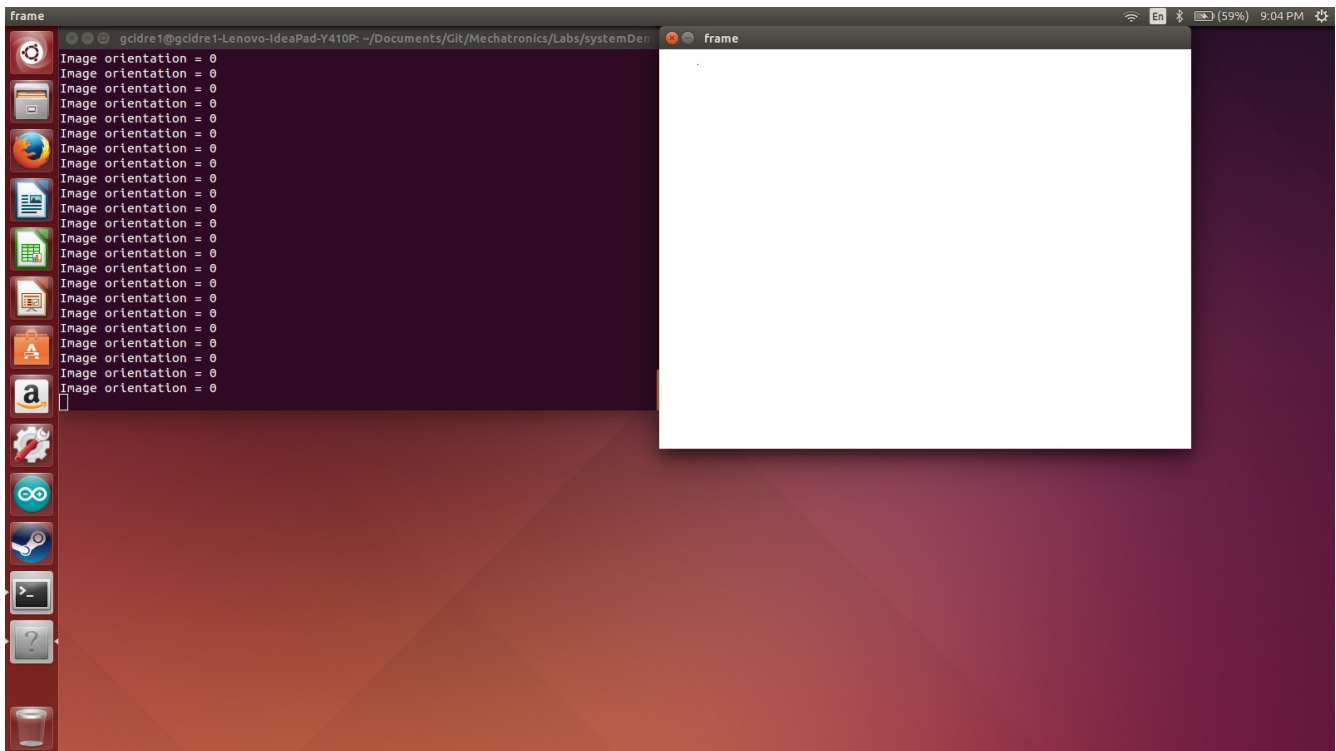


Figure 1: Demo of the vision code. Orientation 0 means no parts are detected.

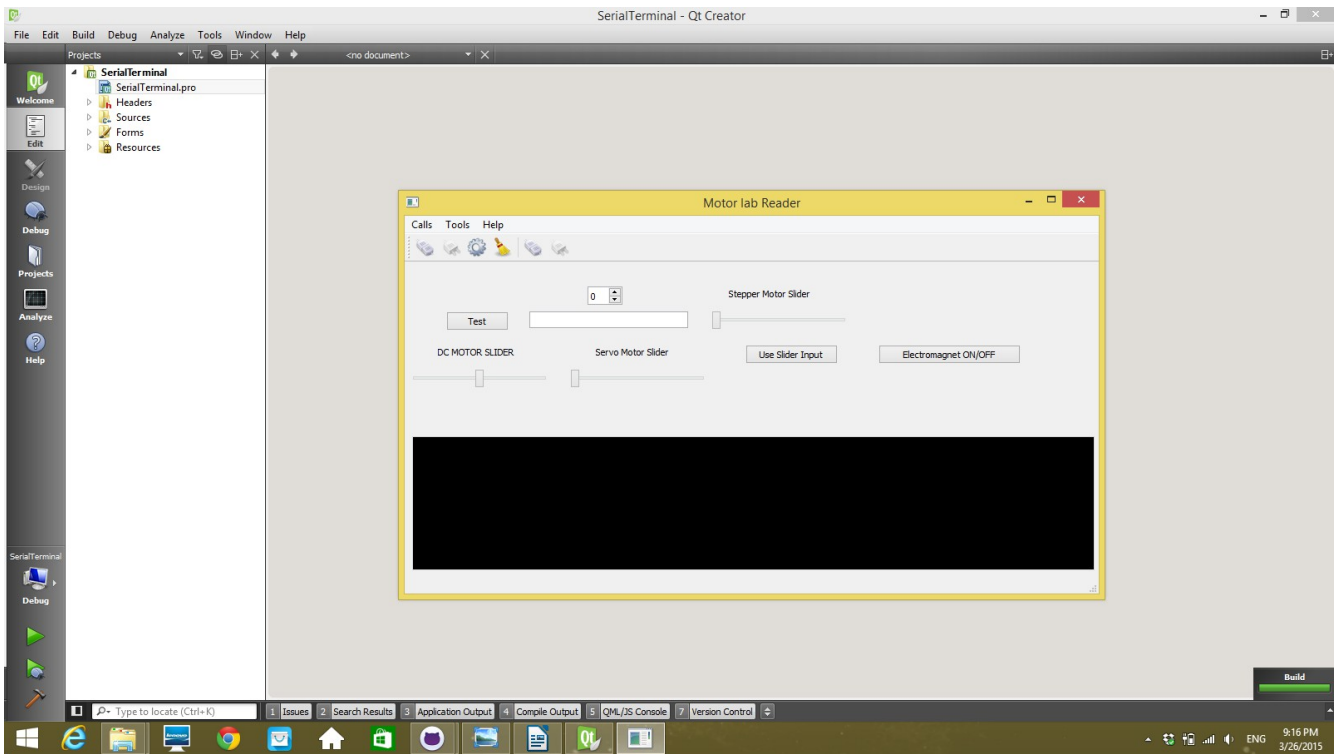


Figure 2: Snapshot of the new GUI.