EE/CprE/SE 491 Weekly Report #11

Oct 27th - Nov 9th

Group Number: 3

Project Title: Squirrel

Client: Bob Thompson; Advisor: Gary Tuttle

Team Members: Isaac Tegeler, Devon Driscoll, Richard Cushing, Dan Gilbert, Abraham

Contreras-Ramos, Cole Patton

Weekly Summary:

Began wiring the motor controllers and motors to the jetson nano and power supply. Continued to print parts for the mechanical system.

Past week accomplishments

Isaac: Worked with Abraham to wire power supply, motors, and motor controllers. Wired motor controllers to the jetson nano and began testing code. Found an issue with the Jetson nano's GPIO pins where there is a voltage drop of ~1.5 when connected to the input terminals on the motor drivers. As a result the voltage is not high enough to be marked as HIGH by the drivers. (needs to be ~2V). Started wiring to an arduino uno instead and was able to control motors with that instead.

Cole: Retrained the squirrel detection code with a smaller weight set to increase the detection speed. Went from running at around 1 fps to running at 5 fps. Looked into quantization and how to potentially speed up the detection further by storing the weight data as 8 bit integers instead of 32 bits. This caused me to run into some problems that might take a while, so the quantization is going to have to wait until the end, if we have extra time. Passed the Jetson Nano over to Isaac so he can begin wiring everything together.

Richard: Ordered more PLA, continued printing parts for gimbal. Printed status 21/32. Bigger parts that take 12+ hours saw some warping issues as the heated bed, being on the part for extended length, would start lifting the part.

Abraham: Finished constructing the power supply circuit to the motors and drivers.

Dan: Made cuts/holes on the PVC pipes used for the targeting system. Continued printing parts for gimbal

Devon: Working on writing as much code as possible without being able to test it at the moment.

Pending issues:

We are unable to use the Nvidia jetson to control the motors because of the GPIO output voltage issue. We are going to try to increase the voltage with an amplifier and if that does not work we will need to use the arduino to drive the motors. While this is not ideal it is our only option at this point. We are also running out of time to assemble all of the systems so we will try to get 1 or 2 completed to be able to demo.

Hours Worked

Name	Contributions	Hours this week	Hours cumulative
Isaac	Worked on wiring motors to the motor controllers and getting movement.	15	53
Cole	Retrained the model and got the detection code running at 5 fps instead of 1. Looked into "post-training quantization"	6	46
Devon	API code	8	37

Richard	Printing out the bigger time consuming 3D printed parts of the Camera Gimble	15	39
Abraham	Wire together power supply and motors.	8	32
Dan	continued printing parts for prefab gimbal, cut parts in machine shop,	5	38

Plans for the upcoming week

Isaac:

I am going to try to get some movement with the steppers completed, build the launcher, and possibly trigger launching from the jetson. Will also need to work with cole to get the computer vision to trigger the launching. Need to work on the presentation and poster as well.

Cole: Help getting the detection code to trigger the launching, and help out with hooking everything together.

Devon: Continue working on functions in our API on our repository. Work on final assignments like the poster, presentation, etc. Launching methods need to be written as well as some other API functions.

Richard: Continue printing the rest of the 3D parts. Possibly go to try to cut pieces we bought.

Abraham: Address any issues regarding insufficient power. Assist team members with their tasks.

Dan: Finish printing and testing parts for gimbal. Assemble gimbal/ targeting prototype. Meet with Dr. Tuttle again. Work on poster and final report. Prepare for demo.