sdmay19-20: MicroCart (Microprocessor Controlled Aerial Robotics Team)

Week 4 Report
September 10 - September 16
Client/Advisor: Dr. Phillip Jones

Team Members

James Talbert — *Hardware*
Nina Moriguchi — *Quad Simulator*
Sarah Koch — *Controls*
Tony Bertucci — *Ground Station Master*
Tina Li — *Quad Software*

Summary of Progress this Report

We performed a demo of the most recent stable build at the ECpE scholars fair. We also met with previous team members to debug issues leading up to that demo. Using that information, we determined what to use from previous teams going forward and what to prioritize this semester.

Pending Issues

The quadcopter's wiring is unstable and not reliable, this caused some problems during the demo. It is difficult to get access to all the old team members, and the current project documentation is lacking in some areas, so getting up to speed is proving challenging.

Plans for Upcoming Reporting Period

James will continue creating components of the hardware design in Vivado to enable future development. Tina and Sarah will work with feedback from the client on defining the requirements for a PCB to improve connection stability and add power management features. Sarah will be receiving updates from previous control lead on functionality and status of control model created last year. Tony will continue to test existing and new functionality for the ground station. Nina will explore library/framework options for designing the quadcopter simulator to allow for automated testing of the quad software.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
James Talbert	Began migrating the FPGA design to Vivado, creating scripts to automate new project creating and entering only necessary source files into version control.	5	10
Nina Moriguchi	Worked to diagnose and fix problems with the demo, worked with matlab over remote connections. Exploring existing progress/documentation.	5	10
Sarah Koch	Worked to diagnose and fix problems with	7	12

	the demo, and read up on the LQR controller prototyped by the previous team. Organized meetings with former team members. Reviewed documentation on the custom PCB design from last year.		
Tony Bertucci	Worked to diagnose and fix problems with the demo. Read up on documentation from the previous team and tested the ground-station as currently developed. Had an existential crisis regarding employment after graduating.	6	11
Tina Li	Worked to diagnose and fix problems with the demo. Worked with Sarah to review the PCB design from the previous team. Demoed the quad at the scholars fair.	7	12

Gitlab Activity Summary

Action: pushed to, Fri Sep 14 2018
Author: James Talbert
Title: Update launching-vivado.md

Action: pushed to, Fri Sep 14 2018
Author: James Talbert
Title: Update launching-vivado.md

Action: pushed to, Fri Sep 14 2018
Author: James Talbert
Title: Add new file

Action: commented on, Fri Sep 14 2018
Author: James Talbert
Title: Transition current hardware platform to Vivado, Type: Note
Comment: I've moved the old branch for this project to match master, all the old commits are there, just undone by a merge.

Action: pushed to, Fri Sep 14 2018
Author: James Talbert
Title: Merge branch '41-Transition-current-hardware-platform-to-Vivado' of...

Action: pushed new, Fri Sep 14 2018
Author: James Talbert

Action: commented on, Fri Sep 14 2018
Author: James Talbert
Title: Transition current hardware platform to Vivado, Type: Note
Comment: # Components to Build in Vivado
 - [ ] PWM_Recorder
   - [ ] Recorder with shift-register debouncing
   - [ ] Recorder with Debounce counter module (compare with above)
   - [ ] IP Core
 - [ ] PWM Signal Out With Killswitch
   - [ ] PWM Generator
   - [ ] IP Core

Action: commented on, Tue Sep 11 2018
Author: James Talbert
Title: Transition current hardware platform to Vivado, Type: Note
Comment: The 18-19 team has been recommended to essentially start this process over. That will be my job, this will entail starting from the current stable release.

Action: closed, Mon Sep 10 2018
Author: James Talbert
Title: Quad IMU Failing, Type: Issue

Action: commented on, Mon Sep 10 2018
Author: James Talbert
Title: Quad IMU Failing, Type: Note
Comment: Additionally, the pullup resistors in the Zynq chip are 10K, which is very large for an i2c bus. We should include pullup resistors in the PCB.
Note: the system works without the pullups, the signals just look bad (very slow to rise.

Action: commented on, Mon Sep 10 2018
Author: James Talbert
Title: Quad IMU Failing, Type: Note
Comment: The IMU was not being powered. The wiring was re-seated and it works for now.

Long-term solution: a proper PCB for connectors/wiring.
