

MicroCart (Microprocessor Controlled Aerial Robotics Team)

sdmay19-20

Week 8 Report

October 8 — October 14

Client/Advisor: Dr. Phillip Jones

Team Members

James Talbert — *Hardware*

Sarah Koch — *Controls*

Anthony Bertucci — *Ground Station*

Tina Li — *Quad Software*

Nina Moriguchi — *Quad Simulation*

Summary of Progress this Report

- **James**
 - I worked on developing the full quadcopter hardware platform, which was based on the old platform, and the revisions to the submodules made in previous weeks.
 - I discovered that the documentation on the platform design settings was very scant. Each block has specific settings that need to match, or be updated for the new toolset. None of these settings was listed in the repository. This makes it very difficult to tell what was not a concern and was left at default versus what was changed to achieve a specific goal.
 - I am in the process of documenting and testing the new platform specifications. There is a section in this documentation that covers guessed parameters and foreseen potential problems.
- **Sarah**
 - I continued work on the Specs for a custom Zybo board PCB, using input from other team members to create a list of desired functionalities. We discussed ways the PCB could be used to satisfy project needs, such as battery monitoring, as well as ways those needs might be satisfied without involving the PCB. This allowed us to explore the best method for implementation and narrow down the design details for the PCB.
 - I have been in communication with a previous MicroCART member in order to clarify procedures that will be outlined in the Controls Documentation, specifically on how to use files for simulation in Simulink
- **Tony**
 - I worked on continuing to utilize the backend functionality that already has been written in order to connect the new frontend UI components successfully to the quad.
 - I have begun working with Tina to edit the current message type standard in our packets to accommodate the new message types we are trying to send.
- **Tina**
 - Finished writing the software that sends sensor data in real time; still untested as of now.
 - Looked into ways of graphing data in real time

- Read through ground station documentation to see how data is parsed
 - **Nina**
 - Absent.
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Pending Issues

- **James**
 - I am not sure that the hardware platform will work completely. There are an uncomfortably high number of guesses in the project, each of which should be validated, but there is insufficient information to do so theoretically in a reasonable timeframe. The validation will be done with the integrated HW/SW platform, running specific use cases that test the various pieces of the hardware platform.
 - **Sarah**
 - Previous MicroCART members have been reliable in answering questions concerning project functionality, but communications are slow-paced due to their other obligations (full-time jobs)
 - **Tony**
 - I have had a few difficulties determining where exactly is best to send back the extra information each control loop. This might potentially involve having the quad send more data in addition to its normal responses to the ground station.
 - **Tina**
 - Asked Peter about areas of test coverage that he would recommend and place that in the design doc. Talk to EE 333 professor and TAs about PCB project
 - **Nina**
 - Absent.
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Plans for Upcoming Reporting Period

- **James**
 - Next week, I will be creating the software project for the quad in the new toolset. The quad software is split into several chunks that can be compiled in multiple ways, making it likely that the setup will be more complicated than the usual flow for the toolset we are using.
- **Sarah**
 - I will familiarize myself with UltiBoard (the software we will be using to design the custom PCB), creating a few practice boards, and getting feedback from Lab Instructors
 - I will continue open discussion with the team concerning the needs that should be addressed by the custom PCB
 - I will continue communications with previous MicroCART members and update the Controls Documentation accordingly
- **Tony**
 - Next week, I plan on continuing to make my edits to the backend of the Ground Station as well as begin some integration tests to ensure the quad will still be flightworthy once they are made.

- **Tina**
 - Test the code I finished writing using a sniffer to make sure everything goes well
 - Make sure it works with the current graphing framework
 - Plan out the shield/voltage monitor/debugging PCB, approve it with lab instructor
 - Write out the controls output testing code
 - **Nina**
 - Absent.
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Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
James Talbert	<ul style="list-style-type: none"> ● Developed initial HW platform in new toolset 	7	41
Sarah Koch	<ul style="list-style-type: none"> ● Continued work on the Controls Documentation ● Used Design Thinking principles while gathering Specs for the custom PCB 	5	32
Anthony Bertucci	<ul style="list-style-type: none"> ● Prototyped a new method for sending flight data during operation 	3	31
Tina Li	<ul style="list-style-type: none"> ● Finished quad software real time sending sensor data 	4	27
Nina Moriguchi		0	17

Gitlab Activity Summary

Action: pushed to, Mon Oct 15 2018

Author: bertucci

Title: continuing to connect new UI features to mainwindow.cpp

Action: pushed to, Mon Oct 15 2018

Author: James Talbert

Title: Merge branch '41-Transition-current-hardware-platform-to-Vivado' of...

Action: pushed to, Mon Oct 15 2018

Author: James Talbert

Title: Update Quad_Hardware_Platform_info.md

Action: pushed to, Thu Oct 11 2018

Author: James Talbert

Title: Update quad_hw.tcl

Action: pushed to, Thu Oct 11 2018

Author: James Talbert

Title: Update quad_hw.tcl

Action: pushed to, Thu Oct 11 2018

Author: James Talbert

Title: Add new file
