EE CprE 491 – May 21 - 27
MicroCART Senior Design Team
Week 8 Report

October 5 - October 12
Faculty Advisors: Phillip Jones

Team Members:

Alex Bjerke ⸺ *Project Manager*

Amith Kopparapu Venkata Boja ⸺ *Embedded Software Lead*

Theodore Davis ⸺ *Embedded Hardware Lead*

Grayson Goss ⸺ *Technical Lead | CAD Design Lead*

Hannah Mohamad ⸺ *Team Webmaster*

Russ Paulsen ⸺ *Ground Control Lead*

Alfonso Raymundo ⸺ *PCB Design Lead*

Trent Woodhouse ⸺ *High-Level Software Lead*

Past Week Accomplishments

Over the past week, we split into subgroups to do more focused research. The group break-down is:
- Ground Control UI - Trent, Alex
- Microcontroller - Alfonso, Theodore, Grayson
- Embedded Software Design - Amith, Hannah
- Embedded Sensors (Software) - Amith, Grayson
- Test Station Design - Grayson, Russ
- Sensors for Test Station - Alfonso

Pending Issues
- Ground Control - Deciding a design route to follow for allowing C and Javascript code to work nicely together
- Microcontroller - Coming to a final decision
- Test Station - Design research + Sensor decisions

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Alex	Discussed design decisions for the ground control application with Trent. After weighing pros and cons, we narrowed it down to 2 options. Looking into ways for js and C to interact cleanly with each other.	5	26
Alfonso	Did MCU Research on 3 MCU & helped to pick Teensy 4.1 as the main MCU. Tried to work on Test Station but need more info from Prof. Jones. I was sick from Wednesday to Sunday so I did not get much work done this week.	5	29
Amith	Helped Hannah in researching the crazyflie and silverware projects on Embedded software components. Researched on the major embedded software components of a drone like configuring the orientation of the drone by reading accelerometer and gyroscope values. Understood reading RC controller values to determine the motion of the drone. Finally spent some time understanding the purpose of an electronic speed controller.	6	25
Grayson	Continued CAD design of 4.5"x4.5" chassis. Looked into various 3D printing materials to be used for the drone chassis (low-cost). Aided Alfonso and Theo in MCU research for the upcoming prototype. Continued research into various testing platforms for the drone (Could not get the .ipt files to work still).	10	32
Hannah	Research about the embedded software components that can help us on how to configure our drone. Spend time on how to extract useful information from crazyflie project.	4	18
Russ	Continue to think of designs for the test station to make the senors work well with the design. Research the sensors more.	4	17
Theodore Davis	Researched and looks up MCUs to go onto the drone. Looked for smaller and cheaper sensors to go on the Drone	4.5	19.5
Trent	(*In "Plans for Coming Week" section, please put plans you (or your group) have*)		15

Plans for Coming Week
- Ground Control - Trent, Alex

- ○ Create a simple application to test design option 1 - This will test calling C functions from a main javascript app
- ○ Create a simple application to test design option 2 - This will test having a main C application with a javascript wrapper
- ○ Decide which is the better option
- ● Drone Embedded PCB Design - Alfonso, Theo
  - ○ Finalize part selection
  - ○ Find schematic files for each part going on the pcb
  - ○ Select which GPIO's connect to which components
  - ○ Start on PCB Design
- ● Test Station - Alfonso, Russ, Grayson
  - ○ Ask Jones on what he wants on the TS
  - ○ Look for those parts
  - ○ Finalize part selection
  - ○ Start on TS Design (if TS needs to be redesigned)
- ● Embedded software - Amith
  - ○ Figure out the steps to configure the IMU for orientation for our microcontroller
  - ○ Understand calibration of various sensors on the drone
  - ○ Discuss with Hannah on next steps for the setting up the embedded software.
- ● CAD Design - Grayson
  - ○ Look into more materials and dual-extrusion combinations of materials for the 3D printed drone.
  - ○ Continue CAD design for various sizes of the drone
- ● Embedded software - Hannah
  - ○ Configuration setup for the microcontroller
  - ○ Discuss with Amith on our embedded software tasks