

.EE CprE 491 – Fall 2019

MicroCART Senior Design Team

Weekly Report 4

Oct 13th - Oct. 21st

Faculty Advisors: Phillip Jones, Matt Cauwels, James Talbert

Team Members:

Evan Blough -- Technical Team Lead, Embedded Software Lead
Kynara Fernandes -- Ground Control Station Lead
Aaron Szeto -- Controls Lead
Joe Gamble -- Embedded Hardware Lead
Shubham Sharma -- Crazy Fly Implementation Lead, Website Manager
Jacob Brown -- Physical Hardware Lead

Summary for Progress this Week

We made some progress on the development of the second large drone and crazy fly integration. We finished verifying functionality of the circuit boards on the drone. We looked into integrating the VRPN broadcast onto another device.

Past Week Accomplishments

- Finished soldering both Zybo board and breakout board while confirming their functionality - Joe/Jacob
- Attempted to load hardware on to Zybo board - Evan
- Organized PCB Components, Crimped cables for shield board connectors, Made documentation for crimping tools - Evan
- Wrote a new script for drone demo - Evan
- Looked into simulink issue on lab computer (found issue) - Kynara
- Looked into how frontend, backend and gui communicates while trying to implement functionality to UI components - Kynara
- Made documentation for current draw-Aaron
- Implemented the VRPN broadcast to the secondary machine. - Shubham
- Posted documentation and libraries needed for crazyflie to GitLab. -Shubham

Pending Issues

- The vivado project is not configured to work on Windows, need to test on a similar linux OS instead.
 - The project importer gave me a UNC file path error, and I didn't really know where to go from there. I was going to try to install Vivado on my laptop - Evan
- Upgrade second computer while maintaining functionality and ability to compile embedded hardware and software
- Can you reprogram settings on wifi module from board or would we have to desolder it to configure a different networking scheme
- The difficulty of implementing a development environment as a VM.
- Lab computer OS reacts badly to sudo commands. This blocks a few issues.

Individual Contributions

Team Member	Contribution	Week 3 Hours	Total Hours
Evan Blough	Crimped a few Cables, Cleaned / organized PCB components, Got rest of capacitors for shield board from ETG. Made documentation for crimping, Installed Vivado/XSDK on my computer. Practiced drone demo for Friday.	11	43
Kynara Fernandes	Looked into simulink issue. Attempted to implement functionality for new UI elements of ground station.	6	33.5
Joe Gamble	Soldered boards and confirmed functionality of both boards. Taught molex connector techniques for making wire harnesses.	5	31
Jacob Brown	Assisted testing and reinforcing soldered connections on zybo and shield	5	21
Aaron Szeto	Assisted with sorting Crazyfly inventory. Started current draw documentation. Started researching matlab data visualization	5	24
Shubham Sharma	Implemented the VRPN broadcast to the secondary machine. Modifying backend code to retrieve live data from OptiTrack. Posted documentation for crazyflie to GitLab. Reading research papers for flying multiple UAVs using ROS.	10	37

Plans for Coming Week

- Test integrated shield board and Zybo Board
- Program FPGA and test functionality
- Finish making cables to assemble drone
- Start assembly of second drone
- Finish up backend modification to retrieve live data from the crazyflie.
 - Tentatively, fly a crazyflie autonomously.
- Set up a stable working version of the project as the master and set up a version tag.
- Test Vivado project on a newer version of linux so we can update the outdated machine.
- Set up the CAD models to 3D print 4 crazyflie skeletons for tracking.
- HOPEFULLY, getting the ground station communication figured out and implement the functionality of new UI features. I.e., send error data from the module that calculates it to the

Summary of Weekly Advisor Meeting:

We talked about a large number of topics, so I will try to keep this summary concise. We talked about techniques for increasing documentation. Gitlab tags were discussed and how they are useful to other teams because they indicate stable releases. We talked about how useful Virtual Machines would be for increasing project portability. The importance of documentation was stressed at this meeting, so we discussed making videos and readme files. We added the bill of materials to Git. Dr. Jones gave us a reminder to test both the hardware boards before integrating them. We decided the current draw test we did was not sufficient. We talked about where to proceed with the Matlab and controls development. Our

team needed to research the feasibility of implementing VM's and a networking build for multiple drone platforms