sdmay18-17 MicroCART (Microprocessor Controlled Aerial Robotics Team)

Week 8 Report

Reporting Period: 10/23/17 - 10/29/17

Team Members

Blake Pries -- Communications Lead
Dane Larson -- Ground Station Lead
Matthew Kelly -- Documentation Lead and Webmaster
Tyler Imboden -- Quad Software Lead
Jakub Hladik -- Test Lead
Kyle Trost -- Team Lead
Peter Thedens -- Repository Lead
Austin Rohlfing -- Controls Lead

Summary of Progress this Report

Generals Tasks for entire team:

- First Revisions for Project Plan
- Planned for Lightning Talk 3

Quad Software - Tyler and Kyle:

Summary for progress this report:

- Multiple sensor feedback types attempted
- Beginning Stages of Vivado platform working
- Fixed bugs in build process forcing you to make each time you build in XSDK
- Improved markdown file to include FAQ and difficult questions
- Added LEDs and Switches to existing hardware via GPIOs

Pending Issues:

- Difficulties switching to Vivado
- Bad code in src directory
- Lack of documentation in Quad_App Directory

Plans for upcoming reporting period:

- Finish transition to vivado
- Refactor code in src directory
- Document quad_app code using doxygen
- Finish multiple sensor feedback build

Controls - Austin and Blake:

Summary for progress this report:

- Compared Matt's and Ian's methods for moment of inertia measurement
    - Matt's approach (using ECP 220) probably better for us
- Emailed Tara Mina to get in contact and introduce us.

Pending Issues:

- Still lack understanding of controls code running on quad

Plans for upcoming reporting period:

- Consolidate all parameterization docs into git directory
    - Add docs to summarize methods from "Model Development, …"
- Finalize Matlab documentation
- Continue to read through Matt Richs thesis and the document sent to us by professor Jones.

Testing - Peter and Jakub:

Summary for progress this report:

- Addressed comments on testing documentation updates merge request (Peter)
- Moved queue test to third-party testing framework (Peter)
- Reading up on propulsion system simulation in JSBSim (Jakub)

Pending Issues:

- The CI pipeline is down, holding up commits and team progress
- Still need to create a fully functioning JSBSim quad model

Plans for upcoming reporting period:

- Get testing documentation merge request completed (Peter)

- Continue on JSBSim quad model (Jakub)
- Fix CI pipeline (Peter, Jakub)
- Move quad_app and computation_graph to third-party testing framework (Peter)
- Sync up with Blake regarding looking at matlab files, then resume work on reviewing existing matlab (Peter)

Ground Station - Matt and Dane:

See appendix for links to video and documentation.

Summary for progress this report:

- Issue 30 is near complete. Implementation into the GUI is needed.
- Packet documentation is almost complete as well, just waiting on figuring out GUI before writing the last section.
- Tested Message Bundle packet.
- Made comments for improvement of documentation regarding building BOOT.bin file for the Quad Software team.
- Further progress made on backend safety measures.

Pending Issues:

- None currently.

Plans for upcoming reporting period:

- Finish GUI screen sketches.
- Start on initialization file ideas.
- Start on Crazyflie adapter.
- Finish and merge issue 30 branch.
- Finish backend safety measures.
- Look into WireShark plugin for MicroCART.

Name	Role	Contribution	Hours worked	Total
Peter Thedens	Repository Lead	Move queue test	4	51
Austin Rohlfing	Controls Lead	Read up on param’zation in both theses. Contacted Tara from 2017 team	6.5	53.5

Kyle Trost	Team Lead	Fixed bug hindering builds to specific process Added Switches and LEDs to hardware Improved documentation for XSDK Tried switching to vivado	16	74
Matt Kelly	Documentation Lead	Near complete on issue 30, testing of message bundle, and packet documentation.	11	71
Dane Larson	Ground Station Lead	Helped test, got coordinates for safety functionality	4	55
Jakub Hladik	Test Lead	Reading JSBSim reference manual about propulsion system simulation, continuing on the quad model.	3	51
Tyler Imboden	Quad Software Lead	Worked with Kyle on getting multiple build mode completed	8	61
Blake Pries	Communications Lead	Continued reading through Matt Rich's thesis as well as the Quadrotor Dynamics and Control paper sent to us by professor Jones.	5	36

Appendix:

Ground Station Links:

- https://drive.google.com/open?id=0B0R1drxMNqs8ZE1ibE1lenpBRW8
    - This is the link to the Message Bundle Test video.
    - The Message Bundle does not capture packets that get a response from the Quadcopter, this is seen when the ./getparam packet is sent when the Message Bundle is open.
    - There is a test script for the Message Bundle that tests what happens when an empty packet is sent, or when there is an overflow, this is not included in the above photo.

- https://git.ece.iastate.edu/danc/MicroCART/blob/groundStation_Documentation/documentation/groundStation/packets.md
    - This link is to the packet documentation.
    - It has information to add new commands/packets and tables of the overall packet and the data for all the packets sent (if it existed in callbacks.c).