May14-10 Weekly Report

MicroCART 2013-2014
Week 7: October 13-20, 2013
Advisors: Nicola Elia & Phillip Jones

Name	Weekly Hours	Running Hourly Total
Kevin Engel	6	39
Nathan Ferris	7	42
William Franey	6	42
Michael Johnson	5	41
Kelsey Moore	9	46
Lucas Mulkey	10	41
Aaron Peterson	8	42

Weekly objectives

Completed Objectives:
-- matched RX/TX E-sky for adrucopter(Nate/Aaron) still no motor response
--Worked on quad PID controller already in place to get it to fly with last years GUI
--Found and edited data from the camera system for testing
--Learned the oscilliscope measurements for PPM signals going to the quad-copter

Next Week Goals:
-- Ask Matt about data generation for more comparisons (EE's)
-- Practice converting matlab to C files (Nate)
-- Grasp full understanding of PID C file controller (Everyone)
-- Need to test RX/TX with arudcopter, possibly with spektrum equipment

Issues/Concerns

-- (10/20/13) -- Prop/motor issue, possibly replace the front right motor, seems as though it is getting worse.(Nate) -- "as is" its difficult to test for yaw with turntable, issue resolves itself once in the air, which can't be a solution for the turntable because we cannot lift-off the

turntable during calibration.

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Individual Accomplishments

Kevin Engel:

- Tested PPM output on oscilloscope with Kelsey
    - determined the PPM document in email was incorrect regarding the order of signals.
        - Correct order: throttle, pitch, roll, yaw. Range: .64-1.48ms pulse widths
- Studied further about PID controllers
- Worked on the C code to send commands to quad and get camera data with Mike
    - looked through VHDL code on FPGA from 2 years ago for data format, no avail

Nathan Ferris:

- Fixed struts on the quads arms, they kept popping out when landing which resulted in the IR balls getting clipped.
- Spent thursday with Luke trying to acquire sensor data, spent saturday with Kevin, Bill, Luke, and Aaron making another attempt on the sensor data.
- Looked at last years webpage, seemed simple, Mike suggested designing it in something like weebly, and then copying and pasting the code to our domain from iowa state?
- Made simple PID controller in matlab (so did Bill), looked into converting matlab to C, it seems as though a license “Mathworks Coder” is needed, I was not sure if that is the route we have taken in the past or if we even have a license for that on lab computers.
- Looked at current C code for PID, “PIDbehavior” file was the one the CprE’s directed me too. Is there a Doxgyen somewhere? I still need to look at it or get a walk through to still fully understand it.
- Was able to match the arducopter E-sky RX and TX with Aaron, the pin placements were wrong :) and we did a trial and error with the paper guide book for the E-sky in the closet. However we are still not seeing motor movement.
- Continued with Eagle tutorials, possibly ask Alex for pointers in the future.
- Manually flew quad saturday and tried to adjust trims, quad gets in the air and is pretty stable as long as you can do a simple correction with the right stick.
- Also tried to use the turntable with the quad saturday and to get an idea about the yaw calibration. Table works great and has little friction, however getting the quad to behave was a bit tricky. It seemed that every time we tried to “take off” the direction and trim were irrelevant and the quad would swing a different place every time while on the turntable, which resulted in nothing really. We noticed that the front right prop still struggles to catch up to speed upon take off, however once in the air it is fine, possibly replace it?

William Franey:

- Designed simple PID controller in Matlab
- Explored the turntable Yaw controller.
    - tried manual yaw control of quad on turntable
    - looked into implementing yaw controller
- Helped Kelsey and Kevin with PPMs
    - Hooked FPGA up to oscilloscope and debugged our “full-throttle” issues.

Michael Johnson:

- Tested PPM with oscilloscope
- Learned about PID
- Worked on C code to communicate with quad and cameras

Kelsey Moore:

- Tested PPM output on oscilloscope with Kevin and Bill
- Worked on the C code to send commands to quad and get camera data and send signals
- Tried to calibrate the quad to fly with old GUI with Aaron
- Met with James to figure out Refracted code workable and what needs to be done to get it to work.

Lucas Mulkey:

- Spent the majority of the time trying to get sensor data for the EE’s . Unsuccessful. Would like to sit down with Prof Jones tonight if possible and see what’s going wrong. Will continue pushing on this

Aaron Peterson:

- Able to bind receiver for arducopter to controller, no motor response.
- Looked into fixing the miniquads, no response from any motors
- With others on multiple occasions, attempted to get quad to fly stably using both the gui and manual flight