

EE CprE SE 492 – MAY15-28

MicroCART Senior Design Team

Weekly Report 21

February 23 – March 1

Faculty Advisers

Phillip Jones

Nicola Elia

Member	Position	Weekly Hours	Total Hours
Paul Gerver	Key Concept	8	169
Tyler Kurtz	Key Concept	0	160.5
Ravi Nagaraju	Webmaster	1.5	97.5
Adam Campbell	Webmaster	3	102.5
Joe Benedict	Communications	3.5	197.75
Jacob Rigdon	Communications	2	113
Matt Vitale	Team Lead	3	138
Matt Post	Key Concept	4	36

Progress

- 1) Started PID testing
- 2) Internal Gyro Yaw PID testing from last semester worked very well on ECP machine
- 3) Received Magnetometer data
- 4) MultiWii Documentation
- 5) Built and tested first prototype of Zybo power control/monitoring circuit

Plan of Action

- 1) Manual flight demonstration is the highest priority milestone at this time
- 2) Develop data capture from sensor board and camera system for comparative analysis
- 3) Develop data capture of PID coefficients, input signals and motor output (maybe) for plotting and analysis
- 4) Continue documentation process as background task

Pending Issues

- 1) Planned demo for visiting grade-school students was cancelled due to inclement weather - Reschedule time?

- 2) Mounting quad on ECP machine for gyro Pitch and Roll PID testing
  - o Matt Post is going to talk to Matt Rich to get his vision
- 3) Initial test of Zybo power control board failed. It appears the inductor was not mounted to the PCB board properly. The footprint of the inductor is wider than the pad spacing. At this point, it's assumed the circuit design is good. A different inductor or modification of pad spacing on the PCB is recommended.

## Contributions

Paul – 8 Hours, 169 Total

- Got Raw magnetometer data through I2C bypass - 1
  - o Took a different approach than MultiWii code to get Magnetometer data.
  - o WARNING: Setting up the magnetometer like the MultiWii code causes errors that look like connection issues (i.e. reads 20 readings then freezes) This seems to be a common error with other folks so our current method shouldn't freeze up the system
- Collected data of gyroscope readings at 2000dps with 0 - 4 DLPF - 1
  - o No significant change from 1000dps
- BONUS: Changed I2C function calls to use Xilinx Library Calls for better debugging and less code/confusion/need to look up registers for specific actions - 2
- Worked with Matt Post, Ian, and Adam to get quad on ECP machine to test internal gyro Yaw PID - 3
  - o Hopefully we'll get to demo to everyone at the meeting
- Wrote PID Plan of Action - 1

Tyler – 0 Hours, 160.5 Total

- Nothing Reported

Ravi – 4 Hours, 101.5 Total

- Updated Website - 0.5
- Meeting w/Client - 1
- Testing Zybo PCB - 2.5

Adam – 3 Hours, 102.5 Total

- Tested quad on ECP machine with Matt post, Ian, and Paul
- Yaw PID looking promising

Joe – 3.5 Hours, 197.75 Total

- Finished building Zybo power control board and bench tested – 3.5

Jacob – 2 Hours, 113 Total

- Client meeting – 1
- Team Documentation – 1
- Unforeseen conflicts

Matt V. – 3 Hours, 138 Total

- Helped test the Zybo power board

Matt P. – 4 Hours, 36 Total

- Met with PID Team on Friday
  - Started testing PID's on ECP machine. Will need to determine best way to mount the Quad for pitch and roll testing. Going to try and meet with Matt Rich to discuss this and clarify PID structure.
  - Setup weekly work sessions times for PID team: Thursday 2PM and Friday at 4PM
- MultiWii documentation

## Meeting Minutes

- 1) Dr. Jones wants the group to tighten up across the board
  - Lack of group communication has led to missed opportunities
- 2) PID testing is ready to go, but coordination is not happening
  - We will follow Matt Rich's plan on how to manual perform testing
  - Model based tuning will follow if we find it necessary
- 3) Discussion of hardware problem Paul ran into while testing MultiWii
  - Looking for the source of the problem here
- 4) WSR
  - To streamline WSR submission, hard deadline will be Sunday afternoon for submission of project log material