EE CprE SE 491 – MAY15-28

MicroCART Senior Design Team

Weekly Report 13

December 1 – 8

Faculty Advisers
Phillip Jones
Nicola Elia

Member	Position	Weekly Hours	Total Hours
Paul Gerver	Key Concept	14	110
Tyler Kurtz	Key Concept	1.5	124.5
Ravi Nagaraju	Webmaster	6.5	78.5
Adam Campbell	Webmaster	6.5	78.5
Joe Benedict	Communications	17.25	148.75
Jacob Rigdon	Communications	5.5	82.5
Matt Vitale	Team Lead	5.5	109.5

This Week's Progress

1) Regulator circuits ordered
2) Throttle tested motors for hover requirements
3) Preparations made for Project Presentation
4) Began PID testing

Pending Issues

1) N/A

Plan of Action

1) Meet Team Goals this semester
   a. ~~Document All Work Done~~
   b. Manually fly new Quadcopter using RF controller
   c. Integrate new Quadcopter into camera system

Contributions

Paul – 14 Hours, 110 Total
- Project Presentation - 3
- Design Doc Final - 4
- Project Plan Final - 4
- Roll and Pitch PID using sensor board data - 3

Tyler – 1.5 Hours, 124.5 Total
- Attended the meeting - 1.5

Ravi – 6.5 Hours, 78.5 Total
- Weekly meeting - 1.5
- Finalized layouts & BOMs and sent them to Lee - 3
- Updated documentation and powerpoint slides - 1.5
- Updated website with all final documents - 0.5

Adam – 6.5 Hours, 78.5 Total
- Weekly meeting - 1.5
- Worked to get the quad back into RF mode after bluetooth shenanigans - 2
- Thrust testing - 1
- Worked to get the yaw PID functioning, still needs tuning though - 2

Joe – 17.25 Hours, 147.75 Total
- Worked with Ravi on final design of power control boards - 2
- Meeting with John Pritchard and Ravi reviewing power control boards - 0.75
- Meeting with client - 1.5
- Thrust (hover) testing with other team members - 3
- Designing and building onboard power supply for Zybo and RC reciever - 2
- Researching motor thrust data and Zybo power options - 3
- Updating milestone presentation slides - 5

Matt – 5.5 Hours, 109.5 Total
- Met with John to discuss voltage regulator boards - 1
- Edited presentation slides - 1
- Trust testing - 1
- Watched Ravi work on the final design of the voltage regulator boards / learned about how the boards are designed and the complications that arise - 1
- Weekly meeting - 1.5

Jacob – 5.5 Hours, 82.5 Total
- Team meeting – 1.5

- Project Report – 2
- Worked on Presentation – 1
- Observed/Assisted with hover test - 1

Meeting Minutes

1) Task documentation
    - Client reviewed all items and asked for a status report for each one
    - Client stressed the need to clean up and properly comment all programming code
    - Client requested video tutorials for using CAD tools (AutoCAD and SolidWorks)
2) Milestone presentation
    - Wednesday, December 10 from 12:30-12:55 PM
    - Held in Coover 3041
3) SD card for Zybo
    - Need to find out maximum size accepted by Zybo
4) Wi-Fi communications
    - Current PMOD unit cannot use UART protocols
    - Will need to use SPI and initiate communication from the Zybo board
    - Need to connect PMOD to local router first to get MAC address
5) Chassis and hardware
    - New RF receiver needs to be bound to transmitter
    - Need to improvise an onboard power supply for Zybo board and receiver pending the delivery of the power control circuit board
6) PID controls
    - Need to work on mixing signals (with sensor board feedback) with focus on RC flying

7) 3-axis sensor
    - Current data from accelerometer and gyroscope good enough for initial flight tests
    - Need to integrate sensor data with PWM signal from RC controller
    - For next semester: better filtering needed to correct actual gyroscope drift
8) Power control circuit boards (motors and Zybo)
    - Some traces on the Zybo control board are too narrow and need widening to ~40 mil to prevent excessive heat build-up
    - The voltage required to enable the switching regulator on the Zybo control board is above the voltage level that would damage the LiPo battery, so it acts as the over-discharge protection circuit for the battery (no extra components are needed)
9) PID controls

- Next step: work on mixing signals (including sensor board) with focus on RC flying