EE CprE SE 491 – MAY15-28

MicroCART Senior Design Team

End of Fall Semester

Faculty Advisers

Phillip Jones
Nicola Elia

Member	Position	Weekly Hours	Total Hours
Paul Gerver	Key Concept	20	130
Tyler Kurtz	Key Concept	-	124.5
Ravi Nagaraju	Webmaster	-	78.5
Adam Campbell	Webmaster	-	78.5
Joe Benedict	Communications	12.5	160.25
Jacob Rigdon	Communications	-	82.5
Matt Vitale	Team Lead	-	109.5

Plan of Action

1) Manual flight demonstration is the highest priority milestone at this time
2) Improve any and all connections to eliminate all issues related to signal disruption between components
3) Develop data capture from sensor board and camera system for comparative analysis
4) Develop data capture of PID coefficients, input signals and motor output (maybe) for plotting and analysis
5) Determine if vibration is causing poor sensor board data readings
6) Create and/or revise any documentation
7) Establish group work times
    a. Monday – 4:30 or 7 No Matt/No Paul (6-7)
    b. Wednesday – 8 No Matt
    c. Thursday – 4:30 – 8:30 No Joe

Progress

1) Built two units of motor control board
2) Improved connections between the sensor board and Zybo
3) Designed tethering system for low level test flights

Pending Issues

1) Sensor board connections become loose and freeze up program (fixed now)
2) ESC/Motor connections can become loose during PID tuning
3) Sensor board calculations give NaN (case is handled now)
4) Gyroscope calculations for static environment are not suitable for flight
5) Noise on accelerometer and gyro effect readings (semi-fixed in software with different complementary filter coefficients)

Contributions

Paul – 20 Hours, 130 Total

- Attempted to tune pitch PID - 10
- Fix sensor board code to not freeze when sensor board breaks - 5
- Tune yaw PID based off gyroscope velocity (success) - 5

Joe – 12.5 Hours, 160.25 Total

- Mobile Robotics Course – 3 hours
- Mapped components and built two motor control boards - 5 hours
- Mapped components for Zybo power control board - 2.5 hours
- Improved connections between the sensor board and Zybo - 1 hour
- Designed tethering system for low level test flights - 1 hour