EE CprE SE 492 – MAY15-28

MicroCART Senior Design Team

Weekly Report 18

February 2 - 8

Faculty Advisers
Phillip Jones
Nicola Elia

Member	Position	Weekly Hours	Total Hours
Paul Gerver	Key Concept	8	157
Tyler Kurtz	Key Concept	4	155.5
Ravi Nagaraju	Webmaster	4	91
Adam Campbell	Webmaster	4	94.5
Joe Benedict	Communications	8	190.75
Jacob Rigdon	Communications	5	105
Matt Vitale	Team Lead	6	134
Matt Post	Key Concept	5	25

Progress

- Refreshed areas of documentation
- Built Zybo regulator board
- Made a solid base for data logging tools

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

Pending Issues

- Joe - Attempted to test PWM signal with varying voltages on the receiver. ESCs are not initializing (had Tyler reload boot file on SD card, but still not working). It may be the connections.

Contributions

Paul – 8 Hours, 157 Total
- Custom Logic documentation - 6
    - Upgraded Xilinx doc with better labels, links, and traversal
    - Added large section for creating peripheral in XPS, editing files for external ports in XISE, example of running a logic simulator (ISim or ModelSim), synthesizing core, adding core to XPS project, and connecting PMOD pins to custom core
- Quad PID documentation - 2
    - Created document with explanation about the purpose of the task, the integration and the end goal
    - Includes file descriptions
    - Started guide for things needed and how to operate (I will keep the scope small as the ground_station_pid task is run in parallel)

Tyler – 4 Hours, 155.5 Total
- Added logging features on the base station

Ravi – 4 Hours, 91 Total
- Updated website - 0.5
- Met with OmniCoor to discuss data logging methods - 1.5
- Worked with Joe to build Zybo regulator circuit - 1
- Meeting with client - 1

Adam – 4 Hours, 94.5 Total
- Worked with Tyler on logging

Joe – 8 Hours, 190.75 Total
- Compiled meeting minutes and weekly goals - 1
- Lab work - 4
    - Built Zybo regulator board with Matt and Ravi
    - Discussed website with Jacob, Matt and Ravi
    - Discussed documentation with Matt and Ravi
    - Attempted to test PWM signal with varying voltages on the receiver ESCs are not initializing (had Tyler reload boot file on SD card, but still not working). Is it the connections?
- Read data sheet on Pololu 4-Channel RC Servo Multiplexer 2
- Meeting with client - 1

Jacob – 5 Hours, 105 Total

- Client meeting – 1
- Multi-Wii code and work in lab - 3
- Weekly report – 1

Matt V. – 6 Hours, 134 Total

- Met with OmniCoor to discuss logging - 2
- Helped Joe and Ravi build the Zybo regulator board - 2
- Started integration and testing of the above logging system - 2

Matt P. – Hours, 25 Total

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Meeting Minutes

1) Bluetooth

- Collecting ideas for lower latency
- Low energy Bluetooth has inherently lower latency
- Low latency is only necessary for old system integration camera and on board sensor need to be receiving on a comparable level there
- For now, things are reliable - Adam will be moving on to other projects

2) Documentation

- Readme is updated
- Working on documenting Xilinx custom module creation and importing
- Working on documenting Precious code such as PWM, PID, etc.
- What is being logged is slightly confusing for some of the team - documentation should be made, and data teams on both OmniCoor and MicroCART should meet up to discuss this

3) Multi-Wii code

- Continues to be reviewed, documented and commented
- Found I2C code for sensor board magnetometer that may be useful
- Found ideas for smoothing the gyroscope signal that may be useful
- Need to set a deliverable date for documentation generated from Multi-Wii code

4) 492 Advisor meeting with Dr. George Amariucai

- Discussed the 492 meeting and team members agreed that it went well

5) Website

- Team needs to concentrate some resources on the website
- Jacob will be the lead on maintaining website
- Ravi, Matt and Joe will also assist with website migration and improvement

6) Data logging

- Team members need to meet with OmniCoor to work on universal format
- Universal format needs to be extendable
- Items currently being logged
    - Camera system roll
    - Camera system pitch
    - Camera system yaw
    - Camera system X,Y and Z Quadcopter location
    - Camera system timestamp
    - Sensor board roll
    - Sensor board pitch
    - Sensor board yaw (from the gyroscope)
    - Sensor board timestamp
- Items that need to be added to the data logging
    - Raw data from all three accelerometers
    - Raw data from all three gyroscopes
    - PID coefficients for throttle, roll, pitch and yaw
    - Transmitter input for throttle, roll, pitch and yaw
    - Heading from magnetometer
    - Pitch attitude pre and post filtering
    - Roll attitude pre and post filtering
    - PID components of the controls (maybe?)