

EE CprE SE 491 - MAY15-28

MicroCART Senior Design Team

Meeting Minutes - Week 9

October 28, 2014

Attendance:

Team Members: (All Present)

Paul Gerver
Tyler Kurtz
Joe Benedict
Jacob Rigdon
Matt Vitale
Ravi Nagaraju
Adam Campbell

Advisors: (All Present)

Dr. Phillip Jones
Dr. Nicola Elia

Agenda Items and Discussion

- 1) Client requested explanation for delayed progress on specific tasks
 - Battery regulators (motors and Zybo)
 - a) Creating PCB layouts more challenging than anticipated
 - b) Switched to a different software for layout design
 - c) Difficulty finding proper package for step-down regulator that's easily solderable
 - Bluetooth UART communications
 - a) Busy schedules delayed progress on this task
 - In order to expedite solutions, the client advised the entire team that he is to be notified immediately when a task timeline is delayed for a prolonged period
- 2) Repository
 - Client would like a directory added just for videos
 - a) Videos should be 1-2 minute clips of processes, tasks and demonstrations
- 3) MicroCART Project Design document
 - Due tonight - 10/28/14
 - a) Only a few more items need to be added for completion
- 4) PID controls
 - Able to read IR tracker data from the camera system and send it via RF transmitter to the Zybo board

5) Chassis and hardware

- Zybo cover and IR tracker are mounted
- Adapters for single axis and 3-axis test platforms are finished
- 3-axis testing platform is in production and should be delivered next week
- Next steps:
 - a) Lower sensor/Zybo/IR tracker stack below the plane of the motor cap nuts
 - b) Source a RF receiver
 - c) Source more 2-cell batteries
 - d) Mount batteries and RF receiver

6) 3-axis sensor

- Discussed using FIFO or burst read to retrieve data
 - a) Decided to use FIFO because it will provide a snapshot of all the sensors (accelerometer, gyroscope and magnetometer) at a given time
 - b) Burst method will give different time-frames for each sensor
- Timing constraints of the sensor board
 - a) Accelerometers update at 1 kHz and the gyroscopes update at 8 kHz
 - b) The sensor is using a 400 kHz "clock" (baud rate on the I2C bus)
- Next steps:
 - a) Read data from magnetometer and gyroscope
 - b) Determine the exact timing and latency for reading a register
 - c) Interpret output data and relate to real-world values

7) Modeling

- Learning about complementary filters

8) Battery regulators (motors and Zybo)

- Need to find a step-down regulator package that's easily solderable
- Designs are in final stages and should be ready for production by next week

9) GUI development

- Create a preprogrammed demo mode

Deliverables for next week

Paul

- Finishing the automated graph script of flight data
- Work with Matt to read all accelerometer, gyroscope and magnetometer data from the 3-axis sensor
- Convert sensor data to real-world angles

Ravi

- Finish EAGLE schematic for both battery regulators, and then send it to the team for feedback and questions

Matt

- Trouble shoot 3-axis sensor FIFO and burst-read timing issues

Jacob

- Get Bluetooth UART communications working

Tyler

- Restrain myself from strangling Adam
- Recreate my PID controller project

Joe

- Read about complementary filters
- Lower sensor/Zybo/IR tracker stack to below the plane of the motor cap nuts

Adam

- Help Tyler get the PID up and running for balancing the quadcopter on the single axis test platform
- Brainstorming potential ideas for the GUI and other software-related stuff