EE CprE SE 491 - MAY15-28
MicroCART Senior Design Team

Meeting Minutes - Week 4

September 24, 2014

Attendance:

       Team Members: All present
       Paul Gerver
       Tyler Kurtz
       Joe Benedict
       Adam Campbell
       Jacob Rigdon
       Matt Vitale
       Ravi Nagaraju

       Advisors:
       Dr. Phillip Jones

Agenda Items and Discussion

1) Dr. Jones reviewed last week's status report and asked for details and updates from each team member
2) Successful communication via UART to and from the ZYBO
   - "Hello World" message
   - Push-buttons
   - Blinking LEDs
3) Next steps in the Zybo programming
   - Communicating with the 3-axis sensor
   - Sending signals to the motors via the speed controllers
4) Discussed MATLAB programs used for logging data
   - Determined what logs to pars
5) Dr. Jones advised to use PWM signals versus PPM signals where possible because it will require less programming code
6) Voltage considerations when sending signals to the speed controllers
   - No answer at this time
7) Content of the first draft of the project plan that is due Friday, October 3rd
   - Deliverables as listed in the Client Expectations document

- Additional project goal: building infrastructure for future CprE 488 coursework and future research for quadcopter UAV
- Resource requirements and constraints (budget)
- Risk management considerations
- Existing products examples such as research papers and other UAV programs
  a) University of Pennsylvania
  b) Stanford University
  c) Georgia Institute of Technology

8) Group assignments list has been updated on the drive
- Expanded from 8 to 32 items
- Items are becoming interrelated as we gain more knowledge of the "system"

9) FPGA versus Microcontrollers for the quadcopter "brain"
- Microcontrollers cost less and are easier to implement, but offer limited long-term flight development options
- FPGA offers more flexibility in controls and a foundation for implementing peripheral devices and sensors

10) MicroCART repository has been created on the GitLab site

11) Dr. Jones requested that we create tutorials for all accomplished goals
- Upload them to the MicroCART repository
- Written for novice users and include pics with detailed steps

12) Waiting for SDK to be locally installed in the Controls Lab so the ZYBO can be programmed via SD card or USB connection

13) Waiting for access to site for creating the MicroCART web page

14) 3-axis sensor is ready to "talk" to the ZYBO
- Map wiring between them and build robust connectors

15) Voltage regulator for the ZYBO
- Check the specs to verify the voltage range

Deliverables for next week

Jacob
- Research and work with PPM control of quadcopter (488 lab)
- Work with Xilinx tools to start integrating these ideas onto the new system

.Matt
- Write a "Hello World" style program in C code for the ZYBO
- Attempt to write the C code necessary for the reading data from the 3-axis sensor focusing on the gyroscope first

Adam
- Continue working on the terminal application for the ZYBO to interact with the system and execute commands
- Work more with the peripherals which will involve some enhanced VHDL from the other team members

Tyler
- Meet with Omnibot team member(s) to discuss PWM code
- Implement the 4 PWM signals in the PL side of the system (per Jones' requirements)
- Draft C code example of mixer
- Test calculated versus actual characteristics of the ESC to motors interface

Paul
- Create tutorial for a "Hello World" application to run on the ZYBO from creation, synthesis, and then launch
- Create MATLAB parsing script for data logs

Ravi
- Determine best design for ZYBO voltage regulator and compiling respective parts list
- Research possible battery protection components
- Adding summary section to team website

Joe
- Finish steps to mount 3-axis sensor on quadcopter chassis
- Create CAD file for ZYBO mounting adapters and send to Lee Harker for CNC cutting
- Continue with online controls course via Georgia Institute of Technology
- Research speed controller and motor communications and controls