**PURE Progress Plan**

**Name of Project:** Avionics for Unmanned Aerial Vehicles

This project mainly involves using embedded, on-board systems to interface with the sensors critical to monitoring the Unmanned Aerial Vehicle. The central concepts of this project mainly revolve around programming System-on-Chip boards, which interface with external electronics. For instance, this project has involved programming PWM signal generators to simulate the PWM signals sent by the sensors. Next, we had to read the signals using boards with mass I/O capabilities such as Arduino boards, which in turn had to pass the read data, serially, to another fully-featured Linux SoC machine like Beaglebone, which enables us to log all the input data received from the sensors to a storage card, in real-time.

*What we have done so far has been:*

1) Setting up and running Ubuntu Linux operating system on the Beaglebone board with C/C++ compiler.

2) Reading simulated PWM signals from an Arduino board.

*However, we still have to finish the following tasks in this project:*

1) Connecting the Arduino board’s output to the Beaglebone system in order to transfer the read data from the sensors by the Arduino to the Beaglebone Linux machine.

2) Programming the Beaglebone to receive the data coming from the Arduino board, and eventually storing it on the storage card.
3) Deploying and testing the whole system in the UAV itself, using the actual sensors rather than working with simulated PWM signals.

While working on this project, we also introduced a new project into the system, which I will be increasingly focusing on as we complete our original real-time logging system and once we have the required equipment for the new project. This new project is “a mobile interface for video streaming from a camera onboard an autonomous agent.” This basically involves streaming video from the onboard camera directly to a mobile device, such as Apple iPad.

What we have done for this project so far has been:

1) Learning Objective-C, and Apple iPad programming through the materials and the assignments given by the mentor, who has been TA for an iOS programming course before.

And what we still have to do in this research in the future is:

1) Applying the new iOS development skills and our new ideas to design and develop an iPad application which displays camera video mounted on the autonomous agent over a Bluetooth and/or wireless connection.

I am hoping to continue to work on and contribute to this research project in the future since we have had the opportunity to work on a breadth of challenging yet very exciting areas of computer programming; from interfacing with electronics and working with the embedded systems all the way to development of applications on industry’s leading technologies such as Apple iOS development.