EE202C

Networked Embedded Systems Design

IOT Smart Drone

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Week7 Engineering Progress Report

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# Progress Report Referencing Design Document

This is the general format for our reports.

For this section please include:

1. Progress statement ***by each* team member with *attributions* to each team member**. Each team member must contribute a paragraph with a detailed description of their specific contributions to the project mission.
2. Describe problems encountered by the group
3. Describe solutions developed by the group
4. Describe proposed changes in plans by the group
5. Describe any changes in schedule by the group and approaches for resolving schedule delays.
6. Changes that result in design modifications (for example a new interface specification) must also be reflected in design document with a revision update

Progress by each team member:

Peidong Chen: GPS navigation optimization

Yitian Hu: I2C bus test with new sensor

Jiayu Guo: I2C bus test with new sensor

Yang Yang: GPS navigation optimization

Problems:

1. I2C bus will freeze randomly after several read. SPI is not reliable also according to <https://communities.intel.com/thread/78149>. So we only trust UART for communication now.

# Source Code

This section includes a source code development history. This may be a list and description of modules that have been developed along with a brief description (one sentence).

This may also include source code excerpts or entire programs that have been developed that you feel are important to highlight.

Our source code is on [www.github.com/peidong/drone](http://www.github.com/peidong/drone).

# Platform Development

This section includes a platform development history. This may be a list and description of systems including sensor systems, sensor components, embedded platform components and any other assets that have been developed along with a brief description (one sentence).

This may also include architectural diagrams and images of systems have been developed that you feel are important to highlight.

# Development Progress

This section includes a development history of progress in the area of algorithm development, system implementation, or other areas as applicable. This may be one paragraph to one page in length.

1. At first, we think the I2C would be caused by MPU itself, however even if we change the MPU the problem would come up again. Second, we notice by using oscilloscope to test the signal from the SCL( I2C clock on board), the output signal is not square wave, it is nearly a detorted square wave with decay. Also its pull up ability is significantly reduced by simply slowly change the wire resistance. Thus, we try to solve the problem by taking care of our wire. Yet even we soldering the MPU sensor directly to the Edison board. Considering the fast moving on the drone, the situation would appear after some sort stable time. Finally, About the I2C freeze problem, We consult some intel staffs and decided to use an ATMega 328P as a sensor hub to serve as a bridge between the sensors and Edison. We will use the ATMega handle all I2C communications, and used the Edison UART to communicate with the ATMega’s UART. But the trade-off is the speed of the signal for communication.
2. For now, we managed to read pitch, roll and yaw from Arduino UNO by I2C. However, further work needs to be done to setup the UART communication between UNO and Edison including optimal decoding and encoding.
3. We would move forward to PID test when we fixing the I2C problem.
4. GPS navigation algorithm is optimized at the meantime.

# Development Concerns or Limitations Noted

This section includes any discoveries that lead to confusion, recognition of development unknowns or risks, or any other concern. We will address each of these with planning and assistance.

# References

This section lists any new references that you have found important or required in this last week. <http://elinux.org/images/5/54/Using_Intel_Edison_to_Fuse_Embedded_Linux_With_Existing_Drone_Flight_Controllers.pdf>