

ECE 480 - Team 2: Progress Report

A lot has been accomplished over the last several weeks regarding our senior design project. Many key tasks required to begin doing work have been completed. These tasks include getting information from our sponsors, ordering the parts necessary to begin coding and starting the main project part, and delegating the tasks so everyone has something to work on.

Hearing from our sponsors was something that we had been waiting on for nearly a month before they finally got around to giving us some information about what we needed to do. Fortunately for us we were on the right path, and as we assumed our project is very open ended. The main concern we had regarding our sponsor was what type of software we were going to be using on the PC side of the system. They told us that there are two options. One option is using some commercial software they purchased, which is quite advanced and may be challenging to use. The second option was to use a program that they had created in Matlab which takes in less parameters than option one and should be simpler to use.

In addition to our sponsors talking to us about the program to use on the PC, they also let us know what they expect from us as a final result. The result they are most interested in is having a portable box that contains our controller and an Xbox Kinect. Whether it is battery operated or not is not extremely important to them. This project is an early prototype and as stated we have a lot of freedom to do as we choose, and there are not any strict guidelines on how we must accomplish our goal.

The parts required to start coding and setting up our project have arrived. These parts are the PandaBoard, an SD card for the board, and the Xbox Kinect. The first step was to install Linux on the PandaBoard and that has been completed. This process was fairly straightforward, all we had to do was flash the SD card with a precompiled Linux image and plug it in. Flashing the card correctly took several attempts since it was something that none of us had done before. We followed an online tutorial and eventually got it working. Linux has been configured for the board and it is able to compile the code we write for it to run.

Half of the code for the PandaBoard has been completed. A program has been developed to create a TCP server capable of receiving and sending messages over the network. The program is multithreaded to allow an unlimited number of PCs to connect and control the PandaBoard at the same time. A protocol has been outlined in order to successfully communicate messages as well. Hooks have also been implemented in the programs framework in order to allow integration of code for the Xbox Kinect reading and parsing.

OpenNI has been installed on the PandaBoard. It is not clear yet whether we have been completely successful as there are still a few bugs to work out. One of the two sample programs were able to function, and it appears that the PandaBoard is able to find the Xbox

Kinect and read it. It is difficult to develop code on the PandaBoard due to an apparent Java instability issue, therefore it will be necessary to install a similar setup on a laptop running linux in order to develop and test the code. The code developed on the linux laptop will then need to be ported to the PandaBoard and hopefully we will not encounter many problems.

The Kinect has been configured and tested successfully with OpenNI on a Windows system. Various features of OpenNI including skeletal tracking, tracking multiple humans at once, and hand gestures have been confirmed to work in the lab. This is good to have because it is something that might be displayed on design day, and it makes testing the Kinect's range and capabilities much easier compared to doing everything with the PandaBoard.

A first draft of the power system has been drawn up. The specific battery pack and charger that will be used have been selected. Switching Regulators and an AC/DC converter will be purchased pre-built. Once the system has been approved by someone who is more knowledgeable about power, parts will start being ordered and tested.

We have begun to look at enclosures, but this remains the biggest hurdle that still needs to be solved. For a while we were considering pre-made enclosures, but these would leave no room for the battery and charger. Other solutions are still being looked into.