Katherine Kraus

Assignment #3 – Team Contract and Individual Capstone Assessment

For my senior design I wanted to do something that combined my computer science experience and my drive for green energy. So, to accomplish this I am a part of a group who will be creating a solar device that can orient itself for maximum electricity output. The device would be small and consist of a solar panel, two motors or for tilt and rotation, an Arduino, a battery, and a voltage meter. The Arduino will obviously be the brains of the machine and coded in C++. In this project we will not only be coding the system to move and stabilize the solar panel, but also creating and storing a database of positions and movements of the device corresponding to date and time. This will be useful because it can eventually preemptively smoothly position itself in the optimal sunlight absorption location.

Because this will be coded in C++ I will be able to pull knowledge from some of my past computer science courses. One of the courses was my database design and development course where I learned the logic behind creating, accessing, and maintain a current database for information. All assignments and labs for this course were done in C++ so I will be able to directly correlate my knowledge without worrying about language difference. Another course would be computer networks if we have the time to possible create a way for multiple panels to sync with each other to share information. Then there was technical writing. This course taught me how to take my data and put it in a concise and legible manner, and how to present the process and final outcomes of a project in a documented form. This will be important because we will need to keep logs of our meetings, steps taken, and code information. The code information portion is a big one because we will need to log changes, bugs and their fixes, main portions, etc.

My co-op experiences will help me in this project for various reasons. In my first co-op I worked as a part of the process controls at an oil refinery in northern Ohio owned by Huskey. They have since been bought out and are now owned by Cenovus Energy. While there I worked on database management and logical processes, mainly in the form of process logic controllers. This will help with the logic needed to program both the movement code and creating the database it will store and take information from. I will also be using skills gained from my last two co-op rotations where I worked in Singapore for OTTO Waste Management Systems as an analyst co-op. My work there mainly centered around studying and correlating sales data into a database. Once it was made I then helped to create patterns and anticipate sales changes to help them market products and target ads more effectively. This will help will the database and also for making sure the system can take it’s past movement information and create patters and anticipate movements needed.

My motivation for this project mainly stems from a love for green energy solutions and wanting to do something not entirely software based for my senior design project. I am excited to work on this project because I have worked with an Arduino before in my own free time and I really enjoyed it. The results I expect from the project is to have a program that can successfully orient itself. Also, to have a database to help with this that it can pull from to anticipate maximum electric output based on things like day and season changes in sunlight. I will know

when I am done once my group and I have reached this goal. Also, I will know that my group and I have done a good job if it works as anticipated at the end.

For this project the first steps to designing a solution are getting our hands on the physical materials. The main component needed to start is the Arduino because it will be the computer to control the motions made. The rest of the materials have a bit less of an urgency placed on them. As I have access to an Arduino this will not be a huge issue in terms of time and finances. This is because they are not relevant until we have a code that can be tested, but we will still want to get them as soon as possible. Then for the coding portion we will need to decide on how we want to save it because we will probably code some in our own free time and we will all need the most up to date versions. Also, things like code framework and syntax will need to be decided so that all three of us can understand and keep up with each other's coded portions. After we get a preliminary code created, we would move on to a trial and error phase with tweaking and updates to the code until we have a finished product.