Rose Saalman

Professor Annexstein

CS5002

4/15/2023

**Individual Assignment**

Part A –

For my senior design project, my group chose to design an Internet of Things(IoT) sensor network for a microclimate system in a local vineyard. The goal of this project was eventually to deploy the system and measure the effects of solar panels placed over the plants to create an agrovoltaic system that can be used to generate power and protect the plants from possible weather hazards. My individual contributions to this project were testing individual sensors, collaborating with Keith Springs to select the microcontroller and build the program, working together to help wire the circuits for the CEAS expo and control boxes, and creating documentation about the project.

The skills I built upon this semester were programming with embedded systems, understanding wireless communications and serial communications, designing controls enclosures, collaborating with a large group, and improving project management skills. I used skills I learned in previous electronics labs to be able to construct circuits and analyze them with oscilloscopes and multimeters. I also built upon my experience as a control engineering intern and used my previous experience with building enclosures and panels to be able to help design the layout of our control boxes and determine the hardware needed to implement this system in the field. The obstacles I faced during this project were being able to integrate all the goals and expectations of the project into one product. While our group was very successful in completing individual tasks combining the programming of the microcontroller with the power requirements and needed hardware proved to be difficult. In order to make these challenges compatible, several iterations were needed, and the programming of the microcontroller became somewhat of a moving target.

Part B –

Our group accomplished combining different disciplines of electrical engineering, computer engineering, and computer science to create a control system that monitors the rain, soil moisture, temperature, humidity, and ambient light in a vineyard with a user interface. Through working with my senior design team this semester, I learned the importance of organization and keeping track of goals and update them weekly to meet timelines. I also learned the uses of different tools that help manage group work over the internet.

The team was successful in completing a demo for the expo and building a prototype for the system. At the time of this self-assessment the team is still working on meeting some of the constraints for the deployment of the system into the vineyard as well as meeting our company sponsors requests in regards to the deployment. In relation to my team members, I put in an average amount of work. The team members who really lead each discipline were Anthony Napolitano, Keith Springs, and Will Hopkins. Anthony was elected team lead and put in the extra work to ensure that the deadlines were met and communication with the advisors went smoothly. Keith was instrumental in getting our system up and running. He spent ours debugging the program for the microcontrollers and was the “expert” on it by the end of the project. Similarly, to Keith, Will worked with the computer engineers to integrate the application with the microcontroller. Overall, all the team members worked together to produce the final product.