Kevin Duong

ECEG 401

Professor Cheville and Kabalan

Final Reflection

This semester was certainly interesting, filled with both highs and lows alike. To review last semester, I felt as though that I didn’t have much to actually do since we haven’t done much in terms of logistics for the hardware which made it difficult to work in the software since I didn’t know what I needed to do at this point in time and once we thoroughly decided on what we wanted out of the project, it was the end of the semester. The start of the Spring Semester is when we focused on design where I would work mainly on the software with an idea of what we want to do while the other DE’s work on their specific hardware components and this is when Senior Design really started for me.

To be entirely honest, the semester overall and especially figuring out a system to be able to use the ESP32-C6 itself was difficult, in particular, since there aren’t many resources compatible with the C6, I had to learn mpremote(a library capable of speaking a computer to a microcontroller). Something that added an additional layer of difficulty was that this was roughly the time when we needed to prepare for our unit tests and to begin benchmarking, however, it is quite difficult for me to actually construct my unit test due to being software based testing which, I believe, is much different from hardware testing and cannot be comparable the same way. This excludes the actual conversion of the software from CircuitPython to MicroPython which, while seemingly similar, is different enough such that converting the 4000+ lines of code as well as debugging and integrating the new functions was incredibly time consuming and took the entire semester of Axel setting deadlines for me until we returned to the functionality of the previous portal box. While this was quite satisfying, it was just the start as we needed to add the Keypad, Pin, LCD screen, and add different quality of life functions such as different “modes” to provide more security, ease of use, and clarity to the device.

By roughly April, we had rough functionality of the portal box, however, the rest of the time was spent debugging where it felt as though every time that we fixed a bug, another one would appear. Axel and I would spend hours both debugging different errors with the code until we finally got it to a fully working state by early May. On a related note, I am grateful that Axel had software experience because he was able to handle a large portion of the software coding for the database and greatly expanded the capability of the portal box. Without Axel to carry some of the burden of the software, it would’ve taken so much longer to be able to complete the project and the current iteration of the portal box may not be in the state that it currently is in.

While time consuming and frustrating, I had to learn a lot going through the semester and learning different skills in order to complete my tasks. In particular I had to learn a lot of patience, especially having to bear the frustration of debugging just to find more bugs. Another area that I didn’t expect to improve much, but ended up learning a lot more than I expected was on the hardware side weirdly enough. I had to relearn a lot of the basic Electrical Engineering skills such as using a Multimeter and debugging the PCB which I didn’t really get much experience with after ECEG 201 since I opted to take more computer science courses since the hardware courses such as ECEG 350 was unappealing to me. Overall, I was incredibly grateful for the opportunity to work on a project as large of a scale as this one; I had a lot of opportunity to further develop my skills and get practical experience with high level programming while also learning what it is like to work on a team to create a product that can genuinely make an impact.

While I did grow a lot from the opportunity, it also made me realize a lot of my flaws both as a person and an engineer. Towards the end of the semester, I encountered personal problems post Spring Break which disrupted my work efficiency for the entirety of March and April causing me to be behind schedule most of the time until I was able to recover in May. However, while I understand that personal issues are important, I felt as though that it has caused too much of an impact on the workflow that I began neglecting Senior Design which hurt the team as a whole. This included skipping classes because I might’ve been feeling overwhelmed or under the weather or putting in little time because I just simply lacked the drive that I had before life took its course. While it may be difficult to overcome, I believe that without Senior Design, I may not have noticed these flaws and I would carry them into my professional life so I am grateful that I discovered it now.

Overall, I’ve had an amazing experience with Senior Design and how proud I am to see what our team has accomplished within the year that we had. I didn’t know what to expect going into Senior Design, especially after Junior Design, but I think there were a lot of positives that came out of this course even if there were obstacles in the way. I know there is still a lot of work to be done to make the product even better and I wish we had more time to work on it, but the skills I’ve learned and the memories I’ve made are some that I will carry well beyond Bucknell and into my future career.