**Individual Capstone Assessment**

Kate McManus

From an academic perspective, the goal of my senior project is to take everything that I have learned and apply it to a fully functional piece of software. This is an opportunity to combine what I have learned in the classroom with what I have learned during my co-ops to create software that has a practical application. Academically, the senior project is a final test of what I have learned over the last five years and how well I can use what I have learned. Since I believe my co-op was especially helpful in helping me learn to develop software, I am planning to work with my employer on this project to design something that can be useful in their research or solves a problem that hasn’t been addressed yet. I want my senior project to demonstrate that I have developed as a software engineer and am ready for my career after college. Academically, this will be my largest and most complex software project to date.

At the beginning of my college curriculum, I knew nothing about computer science. I had no experience writing software. My first introduction to writing code was in Engineering Models 1 and 2 (ENED 1090 & 1091), where I learned basic code structure and functions using Matlab. After that I learned how to use C++ in Computer Science 1 (CS1021C). These first classes gave me a basic introduction to how to code, and I got to expand my knowledge to more complex coding principles in classes like Data Structures and Programming Languages (CS2028C and CS3003). These classes gave me the basic foundation that I needed to get a start in software development, which still applies to the work I do today, including this project. They also stand out because they were my earliest classes and I struggled the most with them. One of the most important non-technical skills that these classes gave me was in teaching me how to learn. I learned how to think through a coding problem and teach myself how to solve it. This is a skill that has been very useful to me during my co-ops. Problem solving is a very important skill when writing software and will help me solve the problem that my project aims to fix. While these earlier classes taught me how to code, Software Engineering (EECE 3039C). Taught me about the development cycle of software, from beginning to end. The stages of planning and development taught in this class are what I will follow though my senior project.

My co-ops were my first chance to apply what I learned in class to real coding. In my first co-op as a Programming Assistant at Cincinnati Children’s Hospital, I was tasked with fixing an issue with software written by a previous co-op student. I was the only co-op and only developer on the team, so the entire project was my responsibility. This was my first real project and I learned how to test code to find the cause of an error. There was no documentation for the code so I also learned the importance of documenting your development process from the very beginning to make errors easier to fix later on. This is something I will follow closely during my project. My next three co-ops were as a Software Engineering Intern with Naval Medical Research Unit – Dayton. I worked on a wide range of projects here, some with a software team and some by myself. I learned graphics rendering, cross-platform development, virtual reality development, networking, and data collection. I was able to use my programming knowledge to expand my skills and solve real-world problems involving research in flight simulation and military research. This is where I was most able to learn to apply my computer science knowledge and develop my problem solving and creativity skills. The work I did during this time is the inspiration for my senior project. It also helped me define my career goals after college.

I am looking forward to participating in this project because I want to use what I have learned to solve a real-world problem. I would like to have a project that I can show to people in the software industry as proof of my abilities as a software engineer. When hiring, employers often look for an example of a person’s previous work as an indicator of whether they are a good job candidate. I am hoping that my senior project will showcase everything that I have learned in college and how I can use that knowledge in my career. I also enjoy the challenge of writing software that solves a problem and the feeling of accomplishing that task, which is further motivation for this project. I have gained a lot of confidence in my ability to code over the past few years and I believe that this project will also show to myself that I have come a long way and am ready for this career.

Once I have identified a problem my first step will be to design a diagram to break the main problem down into smaller, more manageable parts and map out how I am planning to solve those smaller issues. Once I have identified all of my tasks and how they can be implemented I will organize them in the order that they should be completed. I will order them so that each new addition to the software will build off of the old one, and each one will be thoroughly tested before moving on to ensure errors will be caught early. I will evaluate the project’s completeness by comparing what I have done to the requirements I wrote at the beginning of development. The project will be complete when the requirements are met and the code has no serious errors. I will also ask my employer to evaluate the software to make sure that it meets their expectations. My expected result is a complete piece of software that meets all of my and my employer’s requirements.