**Professional Self-Assessment and Project Introduction**

**21 July 2022**

**Professional Self-Assessment**

This Professional Self-Assessment will serve as a summation of my experiences navigating through the Computer Science program at SNHU and introduce the artifacts chosen for my final project in the Capstone class of the SNHU Computer Science program.

**Program Reflection**

Completing my coursework throughout the Computer Science Program over the last four years and developing an ePortfolio has helped to showcase my strengths and shape my professional goals and values and helped me to be more employable in the computer science field.

Learning to create effective security policies that implement structures that enforce coding standards and best practices, as well as how the Software Development Life Cycle (SDLC) functions has been instrumental in my understanding of team environment collaboration. Understanding how each team member has their own classification and assigned duties, how they all link together to create solid planning, creating, testing and deployment stages was beneficial. understanding how everyone had their own assignment or branch off of the same project yet linked to the team as a whole for peer code review and testing, then finally submitted coding from their branches into the main structure for further development. Understanding these concepts and being able to employ them will make me a more effective team member in the future. For example, the CS-310 Collaboration and Group Project course introduced me to the GIT process and understanding version control, another definition of team collaboration using centralized project storage, with all members of a team accessing the latest version and merging it into their project branches, making the process seamless.

Another concept involving SDLC, communicating with stakeholders is an integral part of the process for a successful project. As learned throughout this program, not gaining transparency and insight with the client or stakeholders will lead to process delay and possibly failure. Keeping an open line of communication early in the process will clarify client requirements, work out any misunderstandings or gaps in communication, as well as minimize rehashing and altering development late in the cycle. After all, the clients are the ones you are creating these projects for, so it is essential to understand one another’s mindset.

Multiple classes throughout this program involved data structure and algorithm creation, as these are the building blocks for more advanced code to grow from. Understanding how these are associated with each other and having the ability to express this through code is an essential component of the computer science program. Most programs incorporate these concepts and would cease to function without them. The concepts of databases and software engineering were found to be the most interesting, as they are the most visual with interactive GUI and understanding all that goes into ensuring a database program will function properly. Included in this would be the addition of error handling and security measures to ensure minimal issues. Security is a cornerstone of any project development to ensure no outside or inside forces gain unauthorized access to privileged data. This security can come in many shapes, to include multi factor authorization protocols, to physical security policies that companies can enforce to ensure data integrity.

Overall, I was introduced to Python in CS-200, CS-250 taught about Scrum, I learned testing and its importance in CS-310. I learned how to incorporate Discrete Math, Stats, Calculus, Physics, and Linear Algebra into computer science as a whole. I gained knowledge on databases and analyzing data. I learned about computational graphics and design. I now understand how to use Python, C++, Java, and other useful applications. All of these skills learned with be essential when utilizing them in my future endeavors.

**Final Portfolio Summary**

For this project, I chose three artifacts that made the most educational impact on me. I selected projects that I really believe I would continue to use in my professional life after the requirements for this class were completed. From software design and testing to base algorithm coding for working data structures, and the creation of user friendly databases centered on the client requirements, all of these artifacts fit together to create a fully rounded demonstration of skills and abilities learned throughout this program.

For the software design and engineering portion of the project, I applied what I learned in CS-320 Software Testing, Automation and Quality Assurance. This centered around testing automated coding ion Javascript with adequate error handling through JUnit tests. To accomplish this, I took the skills that I learned in CS-320 and applied additional testing methods to include assertEquals, assertThrows and assertUpdate, as well as adding constructor variations that effectively test variable combinations entered by the user. This portion demonstrates my skills in software design and engineering by expanding the complexity of my error handling to cover a wide range of outcomes using Javascript.

For the algorithms and data structures portion of the project, I chose to apply my knowledge from CS-250 Software Development Life Cycle to enhance the efficiency and complexity of an API that displays working button controls, frame and panel attributes, and image and text selection. This involved using multiple data structures to store image and sizing data, as well as associated descriptive text. These have associated algorithms which employ postfix increment and decrement operators linked to button controls that in ultimately control which data and image set to display. This demonstrates my skills with algorithms and data structures, as well as my ability to effectively use Javascript.

For the databases portion of the final project, I applied what I learned in the CS-340 Advanced Programming Concepts course and enhanced a mongoDB based database written in Python that will interface with a Node JS application. This application provides a user-friendly interface that pulls data from a central .csv file, with the objective of helping a client identify good dog candidates for search and rescue training through a dynamic dashboard web application that can be run either with MongoDB or Jupyter Notebook. I incorporated what I learned about mongoDB and added in enhanced functionality to the password interface for added access security, and expanded coding for data creation, alteration and deletion into an existing data structure. This incorporated additional error notifications and loops to enhance error handling. This portion demonstrates my skills with databases, as well as my ability to use Python.

**Link:** [**CS499 SNHU Computer Science ePortfolio**](https://michaelpclisbee.github.io/)