

CS-499 Professional Self-Assessment

Samuel Hemond

Hello, my name is Samuel Hemond and I am currently a computer science major at Southern New Hampshire University (SNHU). Previously, I have completed computer science classes at both Great Bay Community College (GBCC) and the University of New Hampshire (UNH). Through these classes, I have had experience with the following programming languages, technologies, and frameworks. In no particular order, I have worked with C, C++, Java, XML, Android, React Native, Open-GL, JavaScript, Python, HTML, CSS, MySQL, SQLite, MongoDB, Google's Firebase Realtime Database, GDScript, Leg Architecture, Assembly, Microchip programming with MPLAB X IDE, TensorFlow with Keras, as well as the MEAN stack using MongoDB, Express JS, Angular, and Nodejs.

Through this ePortfolio, I will be focusing on an Android project using primarily Java and XML. This project covers the topics of design focusing on UI and overall design, algorithms, and security in terms of implementing an SHA-256 hashed password, and databases using both SQLite and Firebase Realtime Databases to store data. Each of these enhancements are discussed in more detail in the next sections of the ePortfolio. I have worked with Java and Android Studio before in a team setting at UNH where we created a 2d tank game and utilized both an SQLite database and a server connection for multiplayer with the server code written in Python.

I have also worked with full-stack development at SNHU using the MEAN stack creating a sample website for a travel company capable of displaying trips to a user with a single-page application for the staff to log into and change available packages. This project included aspects working with the entire stack from the front end containing HTML and CSS to the back end

written in JavaScript and a MongoDB database. At SNHU I also learned about and worked on developing test-driven and security-conscious code and working with MySQL databases. At SNHU I also gained experience working with AI in particular using TensorFlow with Keras using Python to identify handwriting and to solve for the best path in a maze.

I also have experience programming microcontrollers ranging from using Leg microarchitecture and assembly to program Motorola Microcontrollers to using C and the MPLAB X IDE with a PIC18F4550 microcontroller and programming the more common Arduino and Raspberry Pi boards. These applications have ranged from simple bit addition and shifting to working with light sensors, temperature sensors, motors, lights, switches, etc.

I have also implemented many algorithms and data structures while at UNH ranging from linked lists and balanced trees to various scheduling algorithms such as priority scheduling or round-robin and sorting algorithms such as merge sort and quick sort. I also worked with relatively basic mutex locks for multi-threading in a C code environment.

Most of the work outside of the microcontrollers I have mentioned has primarily been class work but I have also worked with GDScript, JavaScript, and React Native on various smaller personal projects. Alongside this work having experience at multiple colleges in the field of computer science has given me a unique and advantageous point of view. Having taken classes at GBCC and UNH that focused more on theory and underlying mechanisms of coding and at SNHU which focused more on directly applicable/practical skills such as stack designs and security flaw analysis has allowed me to approach problems from different angles depending on my current needs.