CS-499 Final Project

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12/14/2024

**Professional Self-Assessment**

**Introduction**

The Computer Science Program has been a valuable experience. It allowed me to showcase my technical skills, add to my professional goals, and add more knowledge and experience to my professional career in software development, both as an architect and a software engineer. Throughout the course, I worked on my problem-solving abilities, improved my technical skills, and adopted collaborative practices, which are vital for thriving within a dynamic industry. My ePortfolio and my completed coursework have helped me to solidify my knowledge in software engineering, data structure and algorithms, databases and security. These experiences not only improved my knowledge, but also helped me align professional goals and expectations with industry values.

**Coursework and Skill Development**

**Collaborating in a Team Environment**  
My career has always been enhanced by working collaboratively. I lead teams to develop user-centered software applications using tools like GitHub for versioning and Slack as a communication tool in both architecture and software engineering tasks. This program has enhanced my experience by working with other tools and reporting my progress to professors and fellow students. I worked with colleagues to develop scalable software during my daily work and this course re-enforces the importance of adaptability and empathy in creating productive team environments.

**Communicating with Stakeholders**  
Effective communication is another essential skill I work on constantly and this course makes this a key focus. For example, I created a technical report and presentation to explain how integrating AWS Lambda and MongoDB enhanced an embedded system. By simplifying complex technical concepts for a non-technical audience, I demonstrated my ability to bridge the gap between technical teams and business stakeholders. This skill will be crucial as I pursue a career in technology, where clear and tailored communication drives successful projects.

**Data Structures and Algorithms**  
Mastering data structures and algorithms is critical for all my work when developing efficient and scalable solutions. In one project, I designed and implemented a priority-based task scheduler for an embedded thermostat system. This required analyzing trade-offs between performance and responsiveness, ensuring that the scheduler met real-time requirements. These experiences have prepared me to design computing solutions that address complex challenges effectively.

**Software Engineering and Databases**  
The program gave me a solid foundation in database management and software engineering. Modularizing the code for the Embedded Thermostat System improved readability and maintainability. This demonstrated my ability to use industry best practices. Integrating MongoDB with AWS Lambda also demonstrated my ability to build cloud-based systems that can manage structured data efficiently. I apply the same skills outside of coursework to create user workflow systems. This further strengthens my expertise.

**Security**  
Developing a security mindset was a recurring theme throughout the program. For instance, while working on database integration, I implemented input validation and error-handling measures to protect against potential vulnerabilities and followed AWS API Gateway Security best practices in protecting my REST API. These practices reflect my commitment to designing secure systems that prioritize data privacy and system reliability. Additionally, in a cybersecurity module, I learned to identify and mitigate common security flaws, which further informed my approach to secure software development.

**Artifacts and Their Contribution to the Portfolio**

My ePortfolio is a cohesive demonstration of the technical skills and knowledge I have gained throughout the program. Each artifact showcases a unique aspect of my capabilities while contributing to a comprehensive representation of my expertise in computer science:

1. **Software Design and Engineering -** the **Embedded Thermostat System** highlights my ability to modularize code, implement error handling, and enhance maintainability. It reflects my proficiency in developing scalable and robust software solutions.
2. **Algorithms and Data Structures -** the **priority-based task scheduler** illustrates my skills in designing efficient algorithms to optimize task execution dynamically. This artifact demonstrates my understanding of algorithmic trade-offs and their impact on system performance.
3. **Databases -** the **integration of MongoDB with AWS Lambda** showcases my expertise in database management and cloud computing. It highlights my ability to design secure, real-time data storage and retrieval systems for modern applications.

Together, these artifacts demonstrate the full range of my technical abilities, from designing efficient algorithms to implementing secure and scalable systems. They also emphasize my adaptability, as the projects span embedded systems, cloud computing, and real-time data management. While not only reflecting on the skills I have gained but also underscore my readiness to tackle complex challenges in professional environments.

**Conclusion**

Completing the Computer Science program and developing my ePortfolio have been instrumental in enhancing my technical expertise, professional values, and career aspirations. Through coursework and hands-on projects, I have cultivated skills in collaboration, communication, algorithm design, software engineering, database management, and security. The artifacts in my portfolio collectively represent my ability to deliver innovative, scalable, and secure solutions, demonstrating my preparedness for a career in the ever-evolving field of computer science. This self-assessment serves as a reflection of my journey and a commitment to continued professional growth.