

## **Professional Self-Assessment**

Completing the Computer Science program at Southern New Hampshire University has been a transformative experience that has not only sharpened my technical skillset but also helped me understand how to deliver real value through software. Through each course—from fundamental algorithms to advanced topics in AI—I've built confidence, honed my problem-solving abilities, and learned how to think like an engineer. The culmination of this journey is reflected in my ePortfolio: a comprehensive showcase of both my technical growth and my ability to design systems with practical, scalable impact.

## **Growth Through Coursework and Professional Development**

Throughout the program, each project pushed me closer to understanding what kind of developer I want to be: one who balances innovation with structure, and who builds for both current functionality and future evolution. I will graduate with Summa Cum Laude honors, achievements that reflect my dedication to mastering both theoretical concepts and their practical applications.

Working on my final capstone project—a turn-based AI word strategy game that evolved from a Q-learning pirate maze—I was able to apply years of accumulated knowledge in algorithms, machine learning, software architecture, testing, and data structures. What made this project particularly meaningful was the opportunity to enhance an earlier reinforcement learning system I built in CS-370: Current and Emerging Trends in Computer Science. Originally a single-purpose maze navigator, I transformed it into a modular, AI-driven word strategy engine. It now features clean separation of concerns, persistent state management, extensible

Michael Crevier

architecture for multiple AI strategies, and progressive game logic. Seeing my earlier work evolve into something more robust and extensible made me appreciate how far I've come—not just in code quality, but in thinking like a software engineer.

My coursework has consistently translated into real-world applications beyond the classroom. In one of my data-focused courses, I created a Plotly Dash dashboard that visualized complex dataset relationships through interactive elements. This project became a significant talking point during my internship interviews, demonstrating my ability to transform raw data into actionable insights. The interviewer was particularly impressed by how I applied my academic knowledge to a practical business context—technical skills that helped secure my current internship position.

Similarly, my work in an embedded systems architecture course inspired practical applications in my personal projects. Using the embedded systems principles learned in this course, I designed automated fertigation pump systems for my garden that improved plant health through precisely timed nutrient delivery. This project required integrating microcontrollers, sensor arrays, and control systems—translating academic concepts into functioning physical systems.

Perhaps most significantly, my machine learning coursework has expanded well beyond academic requirements. After learning TensorFlow fundamentals in class, I've implemented machine learning in multiple home projects: enhancing my security cameras with Frigate for intelligent object detection, developing reinforcement learning models for my Home Assistant to predict and automate household routines, and ultimately applying these techniques in my

Michael Crevier

capstone project. Each implementation required adapting theoretical models to specific contexts, a skill that distinguishes academic understanding from practical engineering capability. This entire process gave me the confidence to pursue software roles that require not just technical aptitude, but also vision, planning, and cross-domain knowledge.

### **Strengths, Goals, and Career Alignment**

As I look ahead to the next stage in my career—particularly in fields like machine learning, decision science, or intelligent automation—I'm guided by a few clear professional goals. I want to work on systems that blend machine learning with real-world usability, and I want to be a developer who is known for writing maintainable, testable, and scalable code. My experience in this program has positioned me well to do exactly that.

For example, designing a custom ML pipeline for my capstone taught me not just how to implement Markov Chains, Monte Carlo Tree Search, and Q-learning—but also how to integrate them into an interactive system in a way that remains performant and debuggable. I now understand how to make machine learning practical, and that's a skill I'm excited to carry forward.

In terms of values, I care deeply about accessibility, clean design, and long-term maintainability. The systems I build should be transparent, testable, and flexible. This value system grew stronger as I learned to design not just to solve problems, but to anticipate evolution—something I focused on heavily in all three enhancement areas of my capstone project.

Michael Crevier

My immediate professional goal is to secure a position as a machine learning engineer where I can combine data engineering, model development, and software architecture skills. Long-term, I aim to lead AI-integrated data science projects that solve tangible business problems while maintaining ethical standards and technical excellence. The breadth of my coursework—from fundamental algorithms to specialized techniques—has prepared me for this career trajectory by building both depth in key areas and adaptability across the entire development stack.

### **Core Topics and Industry-Ready Skills**

My experience throughout the program has helped me build technical fluency across all the major CS competencies. Here's a high-level summary of how I've applied and internalized these concepts:

#### ***Collaborating in a Team Environment***

During my time with Disney Decision Science as an intern, I worked across teams using agile development practices. I often juggled multiple sprint responsibilities—ranging from forecasting dashboards to automated file processing—and learned to communicate clearly through standups, retrospectives, and shared documentation. That same level of discipline shaped how I approached version control and modular development in this project. Throughout my coursework, I've developed skills in Git workflows, documentation, and organized development approaches that facilitate collaboration even when working independently.

#### ***Communicating with Stakeholders***

Whether it was translating AI logic for non-technical teammates at Disney or drafting project documentation, I've developed the ability to tailor technical explanations to a wide range of audiences. For my capstone, I created structured logging, clean user prompts, and robust testing output—all intended to help developers and users alike understand what the system is doing and why. This skill of translating complex technical concepts into clear, actionable information has been consistently reinforced throughout my program.

### ***Data Structures and Algorithms***

My capstone integrates trie structures for word validation, queues and buffers for Q-learning memory, dictionaries and probabilistic models for Markov Chains, and structured logging queues for debug tracking. These aren't theoretical constructs—they were applied with intention to solve real problems in gameplay and AI decision-making. Throughout my algorithmic coursework, I've learned to select appropriate data structures that balance performance needs with code readability and maintainability, ensuring solutions that work not just in theory but in practice.

### ***Software Engineering and Database Integration***

The architecture of my word strategy game is modular, extensible, and deeply influenced by engineering best practices. It includes feature-based Git branching, YAML-based config management, full unit test coverage, and a planned transition into SQLite for enhancement three. I've practiced what it means to build real software, not just pass coding assignments. In database courses, I've worked with both SQL and NoSQL systems, understanding the trade-offs and appropriate use cases for different data storage paradigms.

### ***Security and Maintainability***

While security was not the core focus of the game, I've built systems that respect input sanitization, avoid unnecessary file system interactions, and prepare for future scalability without exposing sensitive operations. My goal is to ensure that my projects remain robust in both the short and long term. Throughout my coursework, I've learned the importance of considering security from the design phase rather than as an afterthought, applying principles like input validation, least privilege, and defense in depth.

### **Portfolio Integration and Artifact Overview**

The artifacts in my ePortfolio are tightly connected. Together, they show how I've evolved from writing single-purpose scripts to designing integrated, adaptive software systems.

### ***Enhancement One: Software Design and Engineering***

This enhancement showcases a complete software rearchitecture. I took a rigid AI maze solver and transformed it into a flexible game engine, adding scoring systems, logging, modular structure, and user interaction—all in line with software design best practices. The enhancement demonstrates my ability to refactor existing code, implement separation of concerns, and build extensible frameworks rather than single-use solutions. The redesigned architecture significantly reduces code duplication and establishes a more maintainable codebase.

### ***Enhancement Two: Algorithms and Data Structures***

This section focuses on my AI development skills: implementing Markov Chains, Monte Carlo Tree Search, Naive Bayes classifiers, and Q-learning to create a smart, adaptive opponent. This enhancement demonstrates not just theoretical knowledge of algorithms, but practical implementation in a performance-sensitive context. The modular design allows for easy comparison between different AI approaches, creating an experimental framework for evaluating algorithmic tradeoffs.

### ***Enhancement Three: Databases***

This enhancement incorporates a full database layer using SQLite, allowing AI training and scoring data to persist across games—demonstrating my backend integration and data modeling skills. The database implementation includes transaction management, prepared statements for security, and an abstraction layer that separates data access from business logic. This design supports scaling to larger datasets while maintaining data integrity and providing analytics capabilities through aggregation queries that track AI learning progress over time.

These artifacts work in tandem to reflect my capabilities across the entire computer science stack. They also show how I think like a builder: how I prioritize code quality, plan for future scale, and design with user experience and extensibility in mind. Together, they represent a microcosm of real-world software development—from architectural planning through implementation to data persistence and analysis.

### **Final Thoughts**

This program has taught me not only how to build solutions—but how to build them well. I've learned to balance algorithmic insight with software discipline, and I now approach

Michael Crevier

problems with a mindset rooted in architecture, testing, and adaptability. The technical foundations established through coursework have been amplified by my practical applications beyond the classroom, creating a virtuous cycle of learning and implementation.

Maintaining a 4.0 GPA throughout the program while simultaneously applying these concepts in real-world scenarios demonstrates both my theoretical understanding and practical capability. Whether implementing machine learning in home automation systems, designing databases that balance performance with data integrity, or creating visualization tools to make data accessible, I've consistently shown how academic concepts translate into practical solutions.

I'm confident that the work in my ePortfolio represents who I am as a developer and who I aim to be: someone who builds smart systems with thoughtful structure and real-world value. As I enter the next phase of my career with this degree, I bring not just technical knowledge, but a proven track record of applying that knowledge to create systems that are elegant, efficient, and effective.