

Owen Jewell

CprE 494

Portfolio Assessment

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As the final year of my time at Iowa State begins, I am excited to look back and appreciate all the opportunities I have been lucky enough to experience, all the learning I have done, and all the other great experiences that have been a part of my journey.

Beginning in the classroom, I have gotten the chance to learn all that I need to implement features as well as design system architecture. Beginning in my first two years, I learned the syntax and basic data structures and algorithms needed to create solutions. However, at those stages, I was mostly creating small solutions for which others had provided instructions and guidelines. After this learning, I got the opportunity to make my own design decisions for a multitude of different projects. Whether it be designing the frontend of an Android app to interface with the backend or designing the implementation of a pipelined MIPS processor, I was now planning and formulating my own solutions. Within these projects, I also got the chance to work with a great number of my peers, which always provided a new outlook or way of thinking that helped me again later down the line. In addition to my technically focused classes, I got the chance to learn about different topics and cultures through the completion of my United States diversity and international perspectives requirements. In courses such as World Food Issues, Russia Today, Human Sexuality, Microeconomics, and more, I got the chance to learn more about social, economic, global, and environmental topics.

In addition to my learning outside of the classroom, I was able to compound my knowledge with other sources. I was able to use two different online courses to learn and practice more with embedded systems after realizing I was passionate about the embedded space. A variety of different videos and articles helped me to refine my skills in different areas for a variety of projects and personal experiments I was working on. I also got the opportunity to consult different textbooks available through the library, especially when I needed help with circuit design or circuit math. All of these resources together helped to expand upon the base that was my class learning.

Outside of traditional learning, I am thankful to be a participant in a few different amazing organizations. As an inducted member of Tau Beta Pi, I strive to live by the organization's principles of professionalism, integrity, excellence, and a commitment to public service. I also got the chance to complete more public services along my path to Eagle Scout as a Boy Scout of America. In addition, I am a member and Captain of the Iowa State Ultimate Frisbee team and have also served as Vice President as well as Strength and Conditioning Chair. This team has helped introduce me to many great peers, learn new skills, and keep my body in good shape. Another organization of which I am a member, the Computer Science and Software Engineering Club, has introduced me to many new topics for exploration and has been a great source of like-minded peers for consultation. Additionally, I had many great interactions with a large number of employers at both the Spring and Fall career fairs every year, which helped to develop my interpersonal skills and foster good relationships.

Throughout my final year at Iowa State, I will be completing a senior design project, which gives me the chance to apply the vital skills I have acquired so far. Already underway, I have begun designing system architecture, researching components, and writing specifications. These skills become like a second nature after I have used them so many times in the past for completing new projects like designing a cookbook website or making a motorcycle crash notification helmet. Throughout these projects, I applied both technical skills, such as working with the MERN stack or soldering components for an Arduino Nano, as well as working as an innovator to design my own solutions.

Looking back at each step of my journey, I get the chance to remember everything that I learned from each experience, whether it be positive or negative. Although I did push myself into many new situations that helped me to grow, one facet I might change is my interaction with professors. Throughout some classes, I did not have many questions, so I did not always interact with my professors outside of class. On the opportunities that I did, I feel I always learned something valuable, so if I could go back, I would push myself to strive to interact with my professors even more outside of class in order to benefit from their great experience and knowledge.

Only in the second half of my journey did I realize my passion for embedded systems. After being exposed in my first Embedded Systems I course, where I got the opportunity to work with peers and contribute to a project, I committed to learning more. I enrolled in and completed Embedded Systems II and am currently waiting to enroll in Embedded Systems Design. I also invested in some supplies and textbooks of my own in order to learn outside of class. These

materials, alongside internet resources, have helped develop and accelerate my knowledge. One big challenge was finding real-world experience to bolster my theoretical knowledge. This was overcome by completing an internship as a firmware engineering intern and then staying on to work remote as an embedded software engineer. These experiences deepened my knowledge to a new level and also provided coworkers who could answer questions and assist with different steps of the learning process.

While working on a personal project to enhance my learning, I was able to make something that was truly helpful to my day-to-day life. Using JavaScript, I wrote a program to pull the assignments that were due next from my Canvas to-do list using the Canvas API. Once the assignment's names and dates were acquired, I used the Twilio API to send an SMS text message. I deployed this program to Google Firebase and set it to run every morning at 8 am so my phone received an SMS reminder. This ensured no assignment slipped through the cracks, and I could start my day by effectively planning what needed to get done. I had never worked with the Canvas API or Google Firebase for deployment. By reading the documentation, I was able to effectively use these resources to create my own tool, which helped me every day.

As my technical skills developed, so did my approach to new problems and ideas. I learned to tailor my plan to the specific subject, as each concept has vastly different resources, scopes, and depth. Throughout my journey, I worked on projects in many different areas, which helped me to distinguish differences in my approaches. In a scope like web programming, there are many libraries that can greatly simplify tasks. However, in a scope like embedded programming, these libraries might consume precious space, and sometimes a custom

implementation is needed. With a custom implementation, there will be fewer resources available to help, so more time must be spent upfront researching, understanding, and especially planning.

Even after my time at Iowa State comes to an end, I will not end my commitment to learning and improvement. By reading something new each day and still working on side projects and experiments, I will continue to build upon and enhance my knowledge. This plan is something that will continue to succeed as it is motivated by my passion for both the topics and the process of improvement. Throughout my journey so far, I have been able to improve both my mind and body by working on them each day. The habits, knowledge, and experiences I have acquired will serve as the rock-solid foundation of my learning ahead, which will only be compounding as I strive for the best in both my career and life.