Cumulative Reflection

When applying to Iowa State, I wrote about why I wanted to attend. I spoke about hearing about my parents, brother, uncle, and great-grandfather's adventures at Iowa State and how I wanted to have my own. I remember sitting in my dorm room when my parents left and thinking, "Now what?". Now, looking back at my adventure, I know the answer to the question that I asked over 3 years ago. I had an adventure filled with learning new skills, amazement at all the amazing things in my field, challenges to solve problems, friends to create memories with, clubs to give me hands-on experience, and internships to give me a taste of internships.

I started my college career during the height of Covid, so I spent hours in my dorm room with nothing to do. To combat this I joined Solar Car and quickly immersed myself in all the learning opportunities available. I started working on the embedded team and learned some of the basics of embedded systems and how to use GitHub, which was an invaluable tool for the remainder of my time at Iowa State and in internships. I then switched to working on the hardware side of the Solar Car, learning how to do PCB design. I was fortunate enough to have many upperclassmen students on the team, happy to answer any questions I had and invest the time in me to teach me all the skills. This was also beneficial as I progressed through my classes as I knew what classes were interesting and glimpsed pieces of knowledge applicable to them. My time working on electrical hardware also started to develop my self-learning skills. I remember sitting in my dorm room and realizing that a part I needed for PCB design was not our part library, so with the assistance of Google, I figured out how to make a schematic symbol and footprint for myself, which allowed me to have the board design ready for the deadline.

Another club I joined was Critical Tinkers, a club designed to group and support engineers as they work on personal projects. I ran into a cross-country runner from another high school I raced with a few times, and we decided to try to make an electric remote-controlled hot air balloon. This was my first technical project, and I learned so much from it. and was able to combine information from all the classes I took when figuring out the design of the balloon shape we needed to achieve the right volume. I was able to make use of a bunch of the math I was learning in Calculus 2 to model the outer curve of the balloon with an equation, revolve it around an axis to get the volume, and then cut it into sections that we could cut from plastic to make the shape out of sheets. I combined all that math with the programming skills I was learning to write a script to calculate and spit out all the cutting dimensions for manufacturing. This project opened my eyes to the value and connection of all the classes I took together.

As I entered the second semester of my freshman year, I got to expand my knowledge and experience with the solar car team. We started to integrate all portions of the electrical

system together and test them running together. The upperclassmen friends that I made continued to teach me as we figured out how to get the car running for the first time. I learned many skills for system debugging, how to isolate problems, maintaining safety practices, and working with a large team to accomplish a common goal. At the end of the year, they suggested I take the leadership role on the team for the future.

Despite not feeling ready, I followed the prompting of my peers on the team and became the assistant electrical director for the solar car team. This leadership experience allowed me to learn how to plan meetings, monitor project progress, solve interpersonal problems, recruit members, and the intrigues of managing money for an organization. My experience as an assistant electrical director prepared me for future leadership roles. I took over as electrical director in my junior year and continued to hone my leadership skills. I also worked to improve the challenge of team safety, working to establish better team safety practices when working around the battery pack. I focused on this as it was my responsibility as the leader to ensure the framework was there to ensure my team's safety. Another task I focused on as a director was new member onboarding. This task was very important to me because I remember how valuable the time my leadership invested in me was. This experience was beneficial as I entered group projects in my classes. I led my group in the embedded system course, carefully assigning portions of the code to the group members, organizing group work sessions, and finally integrating all of the code into the final product. It is still paying out value as I am leading my senior design project as I lead meetings, split work, and manage all of our deadlines for the team.

During my sophomore year, I got hooked by my computer engineering courses. I was taking the introductory to digital logic class and was thrilled to learn how computers work at such a fine granular level. I remember sitting at the edge of my seat as my professor described assembly language and how the hardware runs processes defined by assembly language. I was so thrilled to learn it and continue my learning. When I took the computer architecture class, my wonder continued, and I loved looking at the processors I am familiar with in the context of how they were designed. The project in the course was amazing, as we had the opportunity to make our processor. After building the processor, my partner and I wanted to see it run physically and not just in simulation. We ran the processor on an FPGA, which was an amazing extension to the project. Throughout this class, I developed a relationship with my professor, going into office hours to discuss topics more in-depth and things I had read about outside of class. I am continuing this relationship by taking the following course, CPRE 581, which has been an amazing class to expand my knowledge and challenge me to do a personal reading of research

papers. Even once I complete this class, I intend to read research papers to remain current in the interesting field of computer architecture.

As I look forward to graduation, I plan the next steps in my engineering career. I will be completing a concurrent masters. This continued education will allow me to grow in the depth of knowledge which I enjoy so much in the latter half of my college career. The challenges presented in grad courses should also allow me to grow in my ability to problem-solve and learn independently. In my undergrad career, I struggled to teach myself much theoretical knowledge outside of the classroom structure, but as I have traversed my college career and started to take grad courses this semester, I have found myself becoming better and will continue to as I start a graduate degree. Once I graduate, I plan to continue my education and learn more about the management and financial aspects of the industry through work experience or pursuing an MBA.

As this chapter of my life ends, it is fun to reflect on how much I have learned over the past 3 to 4 years. Many people have set me up for success with my college career here; the professors, teaching assistants, advisors, mentors, peers, and teammates have been a crucial part of my education, and I am very grateful for them. Leaving my undergrad career behind is intimidating, but my experiences here have prepared me for the upcoming challenges, and I am excited to see what my next adventure will hold.