

My undergraduate education in Cyber Security Engineering at Iowa State has provided me great value. I have shown growth in the way I think about engineering problems, how I learn new concepts, how I overcome obstacles, and I have committed to lifelong learning. Through coursework, clubs and industry experience, I have developed a strong floor for a career in cybersecurity.

Doing the Cyber Defense Challenges at Iowa state helped me consider how users used the products that we create as engineers. Part of this competition is a team that tests the usability of your applications and I had to make documentation on how to use these applications. I had to go through step by step creating instructions and attach images to help make sure the users knew how to use our applications. It was a combination of remote access to the computers as well as using our website. Having screenshots within the usability guide helped users stay aligned with the instructions and provided aid in locating buttons or places on screen.

During CPRE 2310, which is the offensive focused cyber security class, I often used the Linux man pages to figure out more about the commands that I was using. Sometimes I wouldn't know the exact syntax that needed to be used for my command, so I would read through these manual pages either online or in the terminal. For example, one of the common tools used is nmap, a port scanning tool, but by default nmap will only scan the most popular 1,000 ports. I wanted to scan all of the 65,535 ports, so I looked at the man page and saw that if I added -p- to the end of my command I could scan all 65 thousand ports. In CPRE 2880 I relied a lot on the datasheet to set my registers correctly. This datasheet contained most of the documentation for the class and helped with any configurations that I made to the roombas during that class.

Outside of class, I have been a regular attendee of the Hacking and Cybersecurity Club at Iowa State. This club has interesting talks on a variety of topics and sometimes has industry professionals visit and present. I have enjoyed my experience with this club very much and I think it is very helpful for anyone interested in cybersecurity. I have also been working at John Deere for 1 and half years as a part time student on their vulnerability management team. This position gave me great experience in many corporate functions, as well as many of the AWS technologies.

During COMS 3090 I was working on the backend of my team's application, which connected to an SQL database. Previously I did not have much experience with SQL and the class lectures did not cover SQL in detail. So, I just started working on learning more about SQL outside of class and started trying to use it during the project. This allowed me to make sure my team was able to store data properly and in an organized way during the rest of the project.

My biggest shift in mindset when approaching engineering problems is the amount of questions that I ask myself about the problem itself. I now think about what the end user wants/needs and how can I accomplish that goal rather than just thinking about how I can solve this problem the fastest for me. One major lesson I learned early on was that I should be estimating time required on assignments more often. Early on I would leave assignments until the day that they were due without doing an initial look to see how long they would take to complete. This led to a lot of pressure to finish up work, but I learned that I should take an initial look at the assignment and space out the work accordingly.

When trying to learn a new engineering concept I try to find examples of this concept being used. I will then try to understand why and how it was implemented in the specific situation and how I

could adapt this to my situation. As I find more examples I start to get a feel for when I should be using this concept and how I can implement it myself.

During CPRE 2880, teams often had a GUI that allowed them to control the roomba. However, I thought that I could take it a step further and create a map on the GUI that would interpret our scan results from the roomba and display any objects that it detected and keep track of the location of our roomba. This experience helped me keep thinking about new innovations that I could add on to existing projects that would improve them for either my team or an end user.

A learning strategy that I have implemented was when a couple semesters into college sometimes a class had exams that allowed a handwritten cheatsheet that I could bring to the exam, and I would feel much more prepared and didn't have to use the cheatsheet much during the exam. The handwritten cheatsheet forced me to actually learn the concepts and write them down myself which helped me prepare much better for my exams. So, I used this method for other exams even where a cheatsheet was not allowed. I would go through different problems and write down what the most important part of the problem was. Then when I would take the exam it felt like I had drilled these important concepts into my head and I would feel much more prepared for the exam.

My short term goals after graduation are to land a full time cybersecurity role. I don't have a preferred niche of cybersecurity, but I could provide the most value in a team that could use automation of their work. My long term career aspiration is work in cybersecurity learning about as many different parts of it as I can. I plan to keep my technical skills by participating in online CTF events with my cybersecurity friends that I have met throughout college.

My time in Cyber Security Engineering at Iowa State changed how I gain knowledge, evaluate engineering problems and build new things. By moving past technical coursework to address usability in competitions, contribute in an enterprise role at John Deere, and develop effective learning habits, I have established a great foundation for engineering in cybersecurity.