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A Reflective Journey: Navigating Your Cumulative Experience at Iowa State University

Introduction

As I prepare to graduate from Iowa State University, I am pursuing a career as a cybersecurity engineer, with a particular interest in roles within a security operations center, a threat intelligence team, or in network onboarding. Throughout my time at ISU, I have consistently grown in my ability to communicate technical concepts clearly and effectively. Each semester, as I encountered new challenges, I focused on breaking down complex ideas into straightforward explanations that both aided my peers' understanding and reinforced my own learning. This growth is reflected in several signature projects: building single cycle and pipelined processors in CprE 3810, researching and prototyping an AI SOC agent in Security and Privacy in Cloud Computing, and collaborating on a fitness app in Software Development Practices. Together, these experiences illustrate my development as a communicator, problem solver, and team contributor prepared to enter the cybersecurity field.

Breadth of Contexts

My experiences at ISU taught me to approach engineering problems with awareness of their broader societal, global, economic, and environmental contexts. In Software Development Practices, my team created a fitness app designed to promote healthier living. The app included calorie tracking, cardio tracking, weight tracking, and a built in community chat. By supporting

individual wellness and providing a social space for advice, it addressed a clear societal need for accessible tools that encourage healthier habits.

In Computer Organization and Assembly Level Programming, I learned that there is no single solution to every engineering problem. Building single cycle, software scheduled pipeline, and hardware scheduled pipeline processors showed me how trade offs shape outcomes. Sometimes the simplest design is the most practical, while other times specialized solutions are necessary to achieve performance goals. This awareness is connected directly to global and economic contexts. Hardware and software choices affect scalability, affordability, and usability across diverse users and markets.

Finally, in Security and Privacy in Cloud Computing, my research on an AI SOC agent highlighted both economic and environmental concerns. Hosting such an agent on AWS or similar cloud services was cost prohibitive, while running it on site shifted the burden to energy consumption and cooling infrastructure. These trade offs revealed how financial decisions intersect with sustainability and energy use, reinforcing that the rapid adoption of AI brings both opportunity and environmental responsibility.

Designing and Solving Engineering Problems

In Computer Organization and Assembly Level Programming, my team struggled with instructions that worked correctly in our single cycle processor but failed in our hardware and software pipelines. We eventually discovered that the single cycle design was producing outputs that appeared correct even though the underlying logic was incomplete. This gave us the false impression that our implementation was fully functional. To resolve this, we created a comprehensive test program that executed every instruction and traced each signal through the pipeline. This methodical approach allowed us to verify correctness step by step and gave us confidence that our final design worked as intended.

In Software Development Practices, the most difficult challenge was communication within a team of four. Each member had different expectations for what the fitness app should look like and varying levels of commitment. To resolve this, we scheduled an in person meeting with our mentor to map out every screen, feature, and deliverable. By agreeing on a minimum viable product and evenly dividing work, we created a clear structure that balanced accountability with flexibility. This taught me how important deliberate communication and task planning are for keeping a project on track.

In Security and Privacy in Cloud Computing, the greatest difficulty was not technical but organizational. In a team of three, one member committed to specific work early on but withdrew his effort as deadlines approached, only revealing this the day before our presentation. My remaining teammate and I adjusted quickly by reframing the project, clarifying what we could present, and preparing our materials without his contributions. When he ultimately failed to appear for the final presentation, we spoke with our professor immediately to ensure that our work was still fairly evaluated. This experience reinforced the importance of accountability in professional settings, where deadlines cannot be moved to accommodate missing contributions.

External Sources and Independent Learning

Across my coursework, I consistently sought out external resources to expand my knowledge and strengthen my projects. In Computer Organization and Assembly Level Programming, my team relied on instruction set references to decode instructions accurately and used both textbooks and MIPS documentation to guide our code. These resources allowed us to verify that our implementations matched expected behavior and gave us tools to debug errors that the standard course material did not directly address.

In Software Development Practices, building the fitness app required us to go beyond class examples. We consulted Java tutorials to implement more advanced features such as GPS tracking,

and we regularly used the Android Studio documentation to understand platform specific functions. These external resources allowed us to create a more functional and user friendly product than would have been possible with only in class material.

In Security and Privacy in Cloud Computing, the final project pushed my team to research topics not formally covered in the course. While the class focused on AWS services, we explored external resources on large language models, machine learning, log collection methods, and techniques for converting logs into usable input for an AI system. We also studied approaches for structuring AI outputs in ways that a human analyst could review and validate. This additional research enabled us to design a prototype that aligned more closely with real world security operations challenges.

Learning Outside the Classroom

My professional experiences have been just as important to my growth as my academic work. At Sentinel Technologies, I served as a SOC analyst and expanded my skills through free training resources such as TryHackMe, ServiceNow, and Splunk. On top of my regular responsibilities, I created a Threat Alarm Explanation sheet that documented every alarm in place, the issues it detected, and appropriate remediation tactics. I also led projects that included decommissioning CAN nodes and configuring PaloAlto firewall devices. These experiences strengthened my technical skills while also teaching me how to coordinate tasks and deliver clear results in a professional environment.

During my time at Principal Financial, I worked on multiple teams and once again took advantage of training opportunities to grow my expertise. I became a ServiceNow citizen developer and applied that knowledge to lead several security automation projects. These projects were completed in addition to my normal workload, which required careful time management and prioritization. They pushed me to collaborate across teams, design workflows that reduced manual

effort, and deliver tools that improved overall security efficiency. The trust placed in me to guide these initiatives reinforced the importance of leadership, accountability, and continuous learning beyond the classroom.

Communication to Diverse Audiences

Throughout my academic and professional experiences, I have learned how to adapt my communication to suit the audience. During my internship at Principal Financial, I participated in a weeklong intern code jam where my team developed a security project and presented it to a panel of judges. Since the judges were not from the ISR or GRC departments, I had to simplify technical details and focus on explaining the problem and solution in terms that were clear to non specialists. This experience showed me how important it is to adjust language and focus depending on the background of the audience.

In my professional roles at both Sentinel Technologies and Principal Financial, I wrote documentation for every process I automated, and in some cases for processes that had no existing documentation. These materials, including the alarm explanation sheet I created, are still in use years later, even as procedures have been revised and improved. Writing for documentation taught me the importance of clarity, precision, and anticipating the needs of future users.

I have also developed effective habits for revising my communication. For presentations, I rely on practice runs and peer feedback to improve delivery and clarity. For process documentation, I ask others to follow my written steps exactly as written. If they encounter a missing step or unclear instruction, I use their feedback to revise the document. This approach ensures that my writing is not only technically accurate but also practical and accessible to diverse audiences.

Lifelong Learning and Growth Plan

Although I have developed strong communication skills in writing and one on one collaboration, I recognize that public speaking remains an area for improvement. I sometimes struggle to project my voice without a microphone, to appear fully comfortable while presenting, and to answer unanticipated questions with confidence. Improving in this area is important because strong presentation skills are critical for leadership, collaboration, and advancing in cybersecurity.

To address this challenge, I will join an organization such as Toastmasters that provides structured practice and regular opportunities to present in front of others. This environment will allow me to strengthen my voice projection, refine my body language, and gain confidence in handling questions that I did not anticipate. I also plan to supplement this practice by recording myself during presentations and asking peers and mentors for targeted feedback, which will help me identify specific areas for improvement. My primary goal over the next 6 to 12 months is to speak at SecDSM, the Des Moines security meetup. Preparing for this talk will give me a concrete deadline, a clear audience, and a professional setting in which to apply what I have learned.

In addition to professional communication skills, I am also committed to advancing my technical expertise. My next milestone is to earn the CompTIA Security+ certification. To prepare, I will build a study schedule that combines official training materials, practice exams, and online labs. I plan to dedicate consistent weekly study sessions and track my progress through practice test scores, adjusting my focus to areas where I score lower. My goal is to complete the certification within the next year, which will both validate my knowledge and strengthen my readiness for entry level security roles. By pairing this certification with my practical experiences, I will position myself for continuous technical growth in cybersecurity.

Conclusion

My time at Iowa State University has shaped me into a communicator, problem solver, and teammate prepared to enter the cybersecurity field. I have grown by learning to explain complex technical concepts in simple and practical terms, supporting both my peers' understanding and my own mastery of material. Through projects such as building processors in Computer Organization, developing a fitness app in Software Development Practices, and prototyping an AI SOC agent in Security and Privacy in Cloud Computing, I have seen how engineering work is always connected to larger societal, economic, and environmental contexts. My professional experiences at Sentinel Technologies and Principal Financial have further reinforced the importance of initiative, leadership, and continuous learning.

Looking ahead, I recognize that growth does not stop at graduation. I am committed to strengthening my public speaking skills by preparing to give a talk at SecDSM, and to advancing my technical expertise by earning the CompTIA Security+ certification. These goals reflect my belief in lifelong learning and my dedication to becoming a well rounded cybersecurity engineer. The combination of my academic training, professional experience, and ongoing development will allow me to contribute meaningfully to the security community and to continue growing throughout my career.