Individual Assessment

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My senior design project is about covert communication channels. From a high level point of view, covert channels transmit data secretly by exploiting a system in a way that wasn't meant for communication. My group and I plan to research and build a framework for designing a covert channel. We then plan to test the framework and build an example covert channel. On completion of this project we will explore many fields related to computer science including networking, program-exploitation, and information theory. We will also be able to gain experience in building a framework which can apply to many tasks in life.

My college curriculum will be very valuable in this project. For example, my computer networking class will give me the foundation I need to understand network based covert channels. Along with that my operating systems class can provide usage when exploring operating system based covert channels. Overall, my college classes have taught me to solve problems that I do not understand. Computer science, specifically programming, has taught me a lot on how to approach problems and conduct them. Lastly, I believe my technical writing course will be of good use for writing our paper and tracking documentation.

My co-op experience will be useful in terms of solving problems I run into. Over the course of my co-ops, I have had to learn programming languages and other technologies I have never seen before. This experience will help when building our example covert channel. Learning to overcome doubt in starting new projects has been a very valuable skill learned from working at SHP as a software developer. At the end of the day, as long as I put the time in and try new approaches in solving problems, I will be able to complete this project successfully. Lastly, I will be able to rely on my team for my shortcomings as I did in my co-ops. Collaborating in teams was the most valuable skill I learned while co-oping while at Blubrry Podcasting as software developer.

My motivation for the project idea was like all my other project ideas. I spend my free time reading random things on the internet, usually going down rabbit holes. It just so happened that I googled "covert communications network" and left the tab open on my phone during the first week of school. I saw that the first result was Google Scholar results and thought this could be a good topic for a project. I also have a book called Art of Hacking by Jon Erickson that I read from time to time. I wanted to stay away from a web application and add some versatility to the projects I have done. I thought gaining some experience on the offensive side of cyber security would be cool.

My preliminary approach to this project is pretty straight forward. Since it is an entirely new topic to me, doing initial research would be the first step. After digesting and understanding covert channels, I thought building a framework and applying our knowledge would come next, followed by building a real example. I expect our results to be judged by two elements - our paper and example. I want our framework to be laid out and clear in our paper we write. I want our example to be very straightforward and creative. In the end, I want someone who knows nothing of covert channels to read our paper and have a good understanding of them and be confident to build one. I will judge my own contributions by how much time I put in and by my

own understanding of the topic. If I ever feel lost in the task we are doing, I'll take that as that I have not put enough time in.