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CS Senior Design

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### Individual Capstone Assessment

Crypto Link is a team of three members, Kyle Spraggins, Grant Galinger, and myself, Josh Phillips. Our goal is to develop a Web Application that will allow the real time, encrypted backups of audio and video recordings. The web application will also implement Google Drive API as well as encrypted messaging capabilities. This design project is about putting together Crypto Links collective co-op experiences and academic progress into a real world application that solves some problems about encryption and data storage. From my academic perspective this design project will allow us to use what we have learned in many different classes and combine them to see this project to the end. This includes the planning and management of building the application, providing the necessary documents that will support the implementation of our design process, actually building the application working with front end and back end design, estimating and meeting deadlines, testing, and providing a working prototype at the end of the next two semesters. This project will allow us to work through the software engineering process and help us understand many different facets of what it means to be a Computer Scientist.

Early on in the academic curriculum at UC, courses such as Engineering Models (ENED1090), Computer Science 1 (CS1021C), and Data Structures (CS2028C) taught me the foundations of programming which I use whenever tackling a programming problem. Since Computer Science 1, I have become fond of the C++ language and use it often when I can. Courses like Data Structures taught me how to more effectively program along with courses such as Design and Analysis of Algorithms (CS4071). These courses have been fundamental in my approach to understanding programming. One course in particular that I would like to focus on is Software Engineering (EECE3093C). My senior design project will be heavily influenced by this course, as in it I was tasked with completing a similar design project. In this course we used formal methods of designing software and writing the required documents that came along with

that. I think that these experiences have provided me with enough knowledge to tackle this design project with my team members on Crypto Link.

As far as co-op experience, I believe my time doing experiential learning as a cyber-security analyst taught me some very important concepts to consider as we are developing our web application. For one, it taught me the importance of presentations to management as well as how to work cohesively as a team member. I learned of potential security vulnerabilities that are important to consider when designing anything, as well as the importance of good encryption. My contribution to the design of this project was suggesting an encrypted messenger. This is extremely interesting to me because a lot of common forms of encryption will be compromised in the future due to the evolution of quantum computers. I want this part of the project to provide users to select their own level of encryption they would like to use when sending information back and forth. An important level they can choose from would be quantum secure encryption that cannot be broken by Shor's algorithm running on a quantum computer.

I am motivated to be a part of this project because I feel that data privacy is becoming more and more important as everyday people rely heavily on their information being stored securely. I am also excited that I can combine my knowledge together with that of my team members to create something unique that helps solve a problem related to encryption and privacy. I am not quite sure where this project will lead us at this time but I am excited to see where it goes. The preliminary approach I would like to take in order to solve this problem includes doing some maintenance as far as coordinating the teams efforts to tackling this problem along the lines of a team charter and project charter. I would like to get us all on the same page so we can select what type of design methodology will best work for our team and tackling this design project.

The expected results of this design project will be to have a working prototype of the basic project description by the end of the next two semesters. This will include a Web Application that will allow the real time, encrypted backups of audio and video recordings. It will also include Google Drive API as well as encrypted messaging capabilities. I will rate my individual contributions based on how effectively I am able to meet deadlines and the readiness of the pieces of the project I have been working on. I will also rate myself based on my ability to

help my teammates, as well as respond to their feedback and communicate effectively. I will know I have done a good job when the project is completed on time, works, and my team members and project advisor are satisfied with the work.