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Individual Assessment

This senior design project is focused on creating ideal paths for bouldering. This will be done in the form of an Android mobile application that scans user captured images of a bouldering wall. The application would then create a map of the nodes and utilize an algorithm to find an optimal pathway. Most likely, the algorithm implemented will follow AI ideology. The found path will be output to the user, possibly in the form of a list of steps or an image highlighting the path. Users will ideally be able to use this application on any bouldering wall to assist them. Final implementation may include difficulty selection to allow users to customize their experience to their desired skill level.

A few of my past courses provided information and experiences that can be directly related to this project. EECE 3093, Software Engineering, taught me about the process of planning and producing software through a semester long project. Details of each step in the process were discussed and implemented through modelling and documentation. EECE 6032, Software Testing and Quality Assurance, covered the concepts of software quality, verification and validation, and the types of testing. CS 4033, AI Principles and Applications, discussed different artificial intelligence algorithms, including different search algorithms to find the optimal pathway according to predetermined 'cost'. All these courses covered information that I believe will be incredibly beneficial when working on this project.

My co-op rotations were all completed with the same group, Digital Technology Solutions' Campus Services IT branch. While I was not able to complete work highly correlated to my education, I was able to continuously teach myself new skills to help myself troubleshoot issues and I think this can be applied to this project. Since I have never been exposed to application development in classes or co-op, this is an area I will need to learn about on my own. Most programming work I was exposed to on co-op was completed in python, which may not be used in this project. However, I think that basic skills and ideologies can translate to any other programming languages we may choose to use. I was also exposed to a few inter-department project implementations, so I believe the different interpersonal skills I received from this, such as communication and teamwork, could be applicable.

I am very interested in the concepts taught in my AI related courses, so I am excited to be able to possibly apply those directly to a project. The problem this project aims to resolve is also very interesting to me. I have never gone bouldering, but I do think the final product could be highly useful for those interested in it. The app development required is also a bit exciting because this is something that is completely new to me and something I am interested in learning about.

I think a solution for this would begin with deciding on a pathfinding algorithm to implement and starting a base application that can access images or the user's camera. I do think that scanning the image to create a map of the different nodes could prove to be difficult,

especially if images aren't very clear. It would need to be able to estimate the distance between the nodes, which might not be possible from just the user's image. This may require some sort of user input, perhaps the wall's height, for it to be accurate. I think a lot of testing will be required to ensure this really works. In terms of results, I think that a working application that can provide a pathway that is feasible for the user and as optimal as possible would be an accomplishment.