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Individual Assessment

Our Senior Design project is all about creating a user-friendly application to aid new climbers in solving boulder problems. Currently, we plan on supporting this application on Android only. Along with the application development, the other main area of work will be in implementing a path finding algorithm. If implemented successfully, any climber should be able to approach a boulder wall, scan a problem with their phone, and receive a step-by-step guide to follow. The format of this guide is yet to be determined. Likely, either a series of instructions for body movement will be output; or ideally, some sort of graphical representation will be generated to demonstrate the moves.

I have not had any application development experience to this point through classwork. My intro to CS and python development classes may prove useful if we decide to go down either path for application development. On the other hand, I did have an intro to artificial intelligence class where we briefly discussed pathfinding, and I should be able to draw from that. On the less technical side, the software engineering class I took should help with project management. This class taught me how to document and progress on long-term tasks throughout the course of a semester and should greatly help in staying organized and meeting deadlines for this project. One example project from this class was implementing a new feature in visual studio code along with unit tests.

My co-op experience should correlate a little better with this project. Primarily, my co-op experience has been doing .Net development on a desktop application. While I realize that desktop and mobile application development may be a little different in nature, most of the skills should still transfer, in addition to the knowledge ive gained of C#. Some preliminary research suggests the .Net framework along with C# can be utilized with Android development, which would be ideal. Ultimately, we may choose other methods of implementing our application depending on our identified needs in the future, but I should still have a solid basis regardless. Ive also written a fair amount of unit tests on co-op so if we need to do any testing of our application that will come very easily. Unfortunately, I haven't yet had experience with integration testing, but I have observed its applications and potential benefits for our project.

I've been bouldering for about 1.5 years and that was the source of this idea. There have been many times when I've been climbing with friends and we've said out of frustration "I wish these things (problems) came with instructions!" When thinking about project topics I always tried to think of something that I would actually use or that combines my major with a hobby of mine and this ended up being a perfect fit. The best part is to test the problems ill get to do some climbing myself! When in the climbing gym casually envisioning this implementation, I always thought of some sort of scanning functionality that would then use ai to generate a video of some humanlike figure doing the problem. Due to time constraints its likely the output will end up being closer to a series of instructions, or a sort of stick figure to show the movements.

In terms of my individual results, I expect to have a functional android application. This application should have access to the user's mobile camera to scan problems. The scanning should be implemented in a way that provides sufficient data for the path finding algorithm to generate optimal solutions. Its likely that some external factors may need to be entered manually when scanning a problem. Some of these may include: user height, wall height, wall angle, section angle (if climb has multiple sections at varying angles), climb grade and so on. All of these will depend on how granular we want to get but would aid us in providing the most accurate solutions. Ill measure success by the degree to which I, and other climbers, are able to follow the instructions to complete climbs and how the perceived effort differs from how we would've completed the climb without instruction. If the end result is something that I wouldn't think of using in my daily climbing trips, then we weren't successful.