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Part 2: **Individual Capstone Assessment:**

9/15/2021

The senior design project that my team will be undertaking is focused on “AI Pursuance and avoidance in a 2d setting. We plan on developing a 2d platforming game in which we will develop 2 neural net/machine learning AI’s. One of the Ais will learn to pursue a target by using pack mentality and pursuing algorithms (like wolves hunting) where they learn to work together. The other AI will be an avoidance AI that learns to hide and run away from adversaries and uses misdirection, hiding, and precise movement. The hope of this project is to push ourselves to learn more about AI, with a focus on how it can learn and adapt to changes and work as a cohesive unit. Academically I hope that my technical skills will be improved by using coding languages and frameworks we have not used before that are used in industry.

My college curriculum has touched on AI at multiple times, both in my Design and Analysis of Algorithms (CS 4071) and in AI Principles and Applications (CS 4033). In these courses, general AI practices and principles were covered so that going into this project I have enough background knowledge to know what I am getting into by developing an AI. In my Software Engineering course (CS 3093C), I developed a multiplayer board game called Tactus with gameplay similar to that of chess. I developed it with Python, more specifically a library called Pygame. My game development experience will allow the 2d game framework of this project to be quickly setup so the focus will be on developing the AIs since that is a much more complex topic. I hope to apply my skills from these courses to my project so that I put that knowledge to good use.

When it comes to my co-ops, I have a lot of development experience in software engineering. In my time working for Marathon Petroleum, I wore hats such as software developer, business analyst, and IT analyst. In these roles, I had extensive experience with developing full stack web applications. This development, while not exactly what this project will be about, still touched on and used coding languages similar what we plan to use here. For example, I had done some C++ work with Marathon, and we are tentatively planning on either using that or C for our project here. Additionally, my organizational skills that I gained from working at Marathon will translate well since I am used to having to work long on multiple different projects. For this project, I will be required to develop not only a video game, but also an AI, and possible even procedural generated environments. Balancing all of this work should be much more doable with my work experience. Another work experience that will translate well here is my time spent as a Software Engineer at GE Aviation. In my time working there, I did development work on an AGILE team where we touched base frequently on the work we were doing. Being used to this quick moving, team based environment will help me since that is similar to what working on this project will be like.

The motivation for this project has three main prongs. The first one is the fact that I have extensive game development knowledge from classes but in excess from my own personal experience. I have developed videos game for fun for the past few years but have never dabbled in AI so this seems a natural evolution. The second reason for this project is the fact that AI is something that has been very interesting to me for the past few years, but I have never taken the time to implement it in any meaningful way. This will be an opportunity to learn a lot, especially if we use machine learning, to widen my knowledge base greatly. The last motivation for this specific project is the fact the project brings together the skillsets of my team and I. My team partner is very technically savvy with things related to AI and stuff of that nature while I am good at designing and implementing big picture ideas, so together, we think we can create something that showcases and challenges our skillsets.

For designing the solution, we are currently in the requirements creation phase where we hope to sift through different directions we can focus on and predict the feasibility of each of the ideas we have. We expect at the conclusion of the project (which was explained in the first paragraph) is to have a 2D platforming game of Tag that implements two unique AI’s with the purposes of avoidance and pursuit, as well as bringing the AI’s together to accomplish goals. As for expected results, we expect that we will be able to create a game that allows both players and AI’s to compete. We will judge this project as a success based on the complexity and completeness of the AI’s and how they interact with one another. The more complex and intricate the behavior, the more successful and the better of a job we will have done. Personally, my focus is delivering on all things that I will be responsible for as fully as I can, while also carrying my own weight in other areas of the project.