Individual Capstone Assessment

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Going into this year’s senior design project, I knew that I wanted to try something new; something that would truly round out my experience at UC. My group decided to create an AI-driven Pokemon battler. We aim to use machine learning to design the battler such that it will beat at least a novice player. It will also be a great opportunity to incorporate some thoughtful game and team design, which is something that none of us have done before. Overall, there is much room for learning and new experiences. I believe that our team will gain expertise in new directions and gain experience of working with a small team.

There is a breadth of information learned at UC that is relevant to this project. With all the project management that has been occurring these last few weeks, it feels like I’m back in ENED 1020, except with more knowledge and experience under my belt. STAT2037: Prob & Stats 1 will also be very helpful and integral to the use of machine learning. The knowledge gained from CS3003: Programming Languages will be very helpful for deciding what language we should use for this project. EECE3093C: Software Engineering will be crucial in addition to ENED for project management and planning. Most importantly, AI concepts learned from CS4033: AI Principles and Applications and algorithmic concepts learned from CS4071: Design and Analysis of Algorithms will be crucial for designing enemies that improve over time.

Honestly, there is not significant influence on this project from my co-op experience in terms of work. I spent all my time working at Northrop Grumman. I learned web development in Angular, automated testing orchestration using Python and Gitlab pipelines, and software development using C, but I do not see that playing a role in this project. However, there are non-technical skills that I learned that can be applied to this project. Communication is one of the skills that I strived to improve the most. It is important to communicate clearly and often to other members of the team when developing remotely, especially when help is needed. There are few things worse than spinning your wheels on a project when progress needs to be made. I also expect to use my presentation skills learned from my co-op experience in this project when speaking to our faculty advisor, presenting project ideas to my teammates, and when presenting the finished product.

As stated above, my primary motivation for this project was to try something new. However, creating a Pokemon battler like this is especially exciting to me because I have played many of the games in the Pokemon series, including *Pokemon Red, Pokemon Emerald, Pokemon Diamond, Pokemon Sword, and Pokemon Violet*. Because I have played these games somewhat extensively, I know things that they have done well and poorly. I also know what strategies they have not included, so that we can more effectively create a unique game. The enemies in these typically do not have a full team and use pre-set strategies. We intend to include only full teams, and using generational machine learning will hopefully give users a more unique experience.

We expect the trainer to be able to adapt to different types of teams. These teams will include different combinations of Pokemon so that the trainer can employ different strategies. We had considered the idea of organizing an event early on to play the game with the teams we’ve created ourselves to give the AI some seed data, but this idea was discarded in hopes that the AI will have a more unique playstyle that is different from humans. The battler will only have to worry about 1v1 battles and the AI will be able to track the state of the game based off of fields such as Pokemon remaining, current health, pokemon types, and pokemon stat changes. Training an AI and giving it a benchmark to reach is not easy to place. We strive to train our AI such that it will beat each of us and other experienced players, but AI training like this can be fickle, especially for a group that is not wholly versed in AI development, so if the AI can beat even a novice player, we will consider that a job well-done.