My senior design project centers around the fusion of machine learning principles with competitive Pokémon battles on the platform Pokémon Showdown. This project aims to develop an AI system capable of strategic decision-making and adaptive gameplay within the context of Pokémon battles. As an individual delving into this academic pursuit, this project represents an exploration of two distinct fields: machine learning and gaming. Originally conceived as a combination of game development and genetic algorithm-based enemy enhancements in a roguelike game, our project's direction shifted to leverage Pokémon Showdown as the training ground for an AI in strategic Pokémon battles. The objective remains unchanged, focusing on utilizing machine learning techniques within the competitive gaming environment to create an AI capable of evolving its gameplay strategies.

My college curriculum at UC has played a foundational role in shaping my approach to this project. Courses like CS4033 - Design and Analysis of Algorithms and CS4071 - AI Principles and Applications provided me with the theoretical underpinnings necessary for comprehending and implementing AI algorithms. These courses equipped me with the essential knowledge to devise and apply machine learning techniques within our AI system for Pokémon battles. Additionally, classes such as EECE3093C- Software Engineering and CS5127 - Requirements Engineering imparted crucial insights into the software development lifecycle and effective requirement planning, which will guide our strategic approach to training the AI effectively within the gaming context.

My co-op experiences further fortified my skill set in preparation for this project. Working as a Desktop Support technician at Cincinnati Financial, I honed interpersonal skills and troubleshooting abilities crucial for cohesive teamwork within a technical setting. However, my tenure as a software developer at Siemens DISW was pivotal in broadening my understanding of software development methodologies, coding practices, and their practical application in real-world scenarios. These experiences not only enhanced my technical prowess but also emphasized teamwork and adherence to industry-standard practices, essential elements for implementing an effective AI training strategy within the competitive environment of Pokémon Showdown.

My motivation for this project is fueled by my enjoyment of the game of Pokémon and a fascination with machine learning applications. While not traditional game development, this project presents an intriguing opportunity to apply machine learning principles within the competitive context of Pokémon battles on Pokémon Showdown. As someone who appreciates playing Pokémon and occasionally engaging on Pokémon Showdown, the idea of training an AI to compete effectively in these battles is both enjoyable and intriguing. Utilizing Pokémon Showdown's game state data, our goal is to create an AI system capable of analyzing this information and independently making strategic decisions to control Pokémon's actions during gameplay. This undertaking merges my hobby in Pokémon with the challenge of enhancing AI performance within the Pokémon Showdown platform.

Our expected outcomes encompass an AI system proficient in adaptive strategic decision-making within Pokémon battles. Self-evaluation throughout the project will involve consistent assessment of code quality, AI performance within Pokémon Showdown, and feedback collection from playtesting. This iterative process will help gauge the effectiveness of our AI training approach and determine the project's overall success. Evaluating codebase efficiency and the AI's performance within the gaming environment will serve as key indicators of our progress and accomplishment in integrating machine learning techniques into Pokémon Showdown effectively.