AI Project Proposal

For the final project we would like to create a Pac Man game agent. The goal behind for our agent “Pac Man” is to avoid the ghosts and collect all the white balls to complete the games levels. Through this project we will need to recreate the game Pac Man, so our agent has a space to play in. We will then need to implement different algorithms for our agent to be built on. The inputs for this project will be the game display. Some examples of these inputs include the walls, ghost locations, and the white ball locations. The outputs for our agent will be key inputs such as “w”, “a”, “s”, and “d”. Each of these keys will control a direction that our agent can go, and this will be how our agent will traverse the game. This is interesting because we all grew up playing Pac Man at some point. So, what better project than to create a Pac Man AI that can play Pac Man better than our younger selves.

The algorithms we will be using for this project will be adversarial search algorithms. We found a paper published by IJCRT (Reference 1) that goes over some example algorithms and how they performed. Adversarial algorithms are useful for games with two players like tic-tac-toe and rock paper scissors. And in Pac Man the two players are Pac Man and the ghosts. Adversarial algorithms are used to determine the optimum move so in Pac Man that would be what direction to travel and if it is worth it to go a direction based on ghost location and how many white balls are located on that path.

The results that we are expecting to see from this projected are our agent being able to complete the maps by collecting all white balls and avoiding all the ghosts. We are hoping to accomplish this result for multiple agent types if time allows otherwise, our agent will be based on adversarial search algorithms. We are expecting to take the most time on reverse engineering the game itself. We are planning to this first as then we can gain more from the class before beginning to try implementing our AI agent.

References

[Ghost AI](https://www.youtube.com/watch?time_continue=270&v=ataGotQ7ir8&embeds_referring_euri=https%3A%2F%2Fwww.google.com%2F&source_ve_path=Mjg2NjIsMjg2NjIsMjg2NjY&feature=emb_logo) for rebuilding Pac Man

[Reference 1](https://www.ijcrt.org/papers/IJCRT2209015.pdf)

[Reference 2](https://www.geeksforgeeks.org/search-algorithms-in-ai/) – Geeks for Geeks (Search Algorithms)

[Reference 3](https://www.geeksforgeeks.org/minimax-algorithm-in-game-theory-set-1-introduction/) – Geeks for Geeks (Minimax in Game Theory)