

## AI Project Abstract

This is Project MCSR by group number 6, consisting of: John Slade, Dwight Fowler, Muhanad Yennes, Kolton Truitt, Austin McBurney, Nicole Parra, Gustavo Coloma, Shivam Patel, Gabriel Kleinschmidt, and Josiah Doucet.

The project aims to beat human players in completing the game “Minecraft” as quickly as possible. This would be applicable to the speedrunning world as it could show how close speedrunners are to a “perfect” run on a given seed. As a group of college-aged students, we have grown up playing video games and trying to beat them faster and faster. This project would help set a baseline for how fast you can beat a fan-favorite game like Minecraft. The aim of this project is to balance dynamic world scenarios with multi-pronged approaches to solving “Minecraft”. The game is infinite in its definition as a sandbox game and thus allows us to simulate some real-world movement as an agent. The agent must solve all major milestones of the game: navigate the world, gather materials, craft items, gather important ores, enter the Nether, fight opponents, find the End portal, and finally defeat the Ender Dragon. The agent must use Reinforcement Learning to do these steps in a way to “speedrun” the game—finishing the game in the fastest time possible.

The project will use data from expert Minecraft speedruns, other AI-driven game simulations, data from ChunkBase([chunkbase.com](http://chunkbase.com)) for the system to have access to the world, and data from MinecraftWiki([minecraft.wiki](http://minecraft.wiki)) for information on each item. This will help the AI learn from human strategies and adapt to different game environments, making it better at handling the game's randomness and challenges. The AI agent will be built using Python and PyTorch for reinforcement learning. Minecraft OpenAI Gym will simulate the game

environment. We will also use Github for version management and to allow multiple people to work on different parts of the project at the same time.