

CS 175: Project in AI (Minecraft/Sokoban): Winter 2023 Project Proposal Group 1

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1. Summary of the Project (40%)

The goal of this project is to develop an agent that is capable of efficiently locating and mining diamonds based on various patterns. The agent will be trained in a set of small worlds with certain patterns regarding the diamonds' locations. For example, we will generate training worlds with caves that have walls made of black stone that have a large number of diamonds and caves that have walls made of some other materials that have none and/or less diamonds. The agent will take the visual input and learn the patterns to find an efficient way to find diamonds.

2. AI/ML Algorithms (20%)

We are considering using some form of Q-learning algorithm, where we award the agent based on the speed at which the agent can find diamonds and the quantity of diamonds it acquires in some time window.

3. Evaluation Plan (40%)

The metrics we are measuring is based on the speed of how fast the agent can find the diamond and the quantity of diamonds that the agent can find in an unexplored world. The baseline is for the agent to learn some pattern for efficiently finding at least one diamond. We are expecting to see the speed of finding diamonds significantly increase along the training process.

We can look at what the actual shortest path of finding diamonds is, and compare it to the path our agent finds. To verify if the internals of the algorithm works, we can design a simple task for it to try on. The moonshot case is for the agent to find every single diamond in the map within the time limit.