

Problem Statement

This project involves solving a maze set up in a way similar to the Pac-Man game from 1980. We will be using both search algorithms and a genetic algorithm, then comparing the results to determine the most effective way to solve the maze. We will be building off of some of the code located at <http://ai.berkeley.edu/search.html>. That website contains all of the graphics processing that will be used to display the mazes as they are solved.

Proposed Approach

The intended AI/ML approach for this problem would be to use a genetic algorithm to generate an optimal moveset that results in reaching the objective. The agents will have a chromosome composed of moves they will make in cardinal directions. Fitness of each agent will be based off a function using the distance from the agent to the goal, the amount of moves it has made, and attempted illegal moves. Elitism, preservation of the fittest agent, will be implemented to avoid accidental loss of progress. In addition, various search algorithms such as A* and Greedy-Best-First will be implemented to help assure the path found is truly of the least cost.

Team Structure

The team will be composed of two team members: David Jefts and Shawn McDonnell.

- David Jefts - Lead Programmer - working on B.S. in CS and an M.S. in SE, programmed Python during internship last semester.
- Shawn McDonnell - Lead Programmer - working on B.S. in CS, experience with genetic algorithms from AI club.

References

"AI Search Algorithm Materials." *Berkeley AI Materials*, UC Berkeley, 26 Aug. 2014, ai.berkeley.edu/search.html.