

Maze Pathfinding Using Search Algorithms

Problem Description :

The Maze Pathfinding problem aims to find a path from a start position to a goal position in a grid-based maze that contains obstacles. The maze is represented as a two-dimensional grid where each cell is either free or blocked.

State Representation :

Each state is represented by a pair of coordinates (x, y) indicating the current position of the agent in the maze.

Actions :

From each state, the agent can move to adjacent cells in four directions: up, down, left, and right, provided the target cell is not an obstacle.

Cost Function :

Each movement between adjacent cells has a uniform cost of 1.

Algorithms Used :

The following search algorithms will be implemented and evaluated in this project:

- Breadth-First Search (BFS)
- Depth-First Search (DFS)
- Uniform-Cost Search (UCS)
- Iterative Deepening Search (IDS)
- A* Search
- Hill Climbing

Heuristic Function :

For the A* search algorithm, the Manhattan distance heuristic will be used to estimate the distance from the current position to the goal.

Team Work Plan :

The project tasks are distributed among team members, with each member responsible for implementing and testing one or more search algorithms.