

A1_Maze_CPP Documentation

Project Description

A1_Maze_CPP is a comprehensive application for working with mazes and caves, featuring pathfinding algorithms and machine learning capabilities for agent training.

Program Features

The application consists of three main modules accessible through the toolbar:

Maze Module

- Load or save maze files
- Generate mazes with customizable parameters
- Set start and end points to find paths through the maze
- Visualize the found path with notification if no path is available

Cave Module

- Load or save cave configurations
- Generate cave structures with specified parameters for cellular automata applications
- Control and visualize cellular automata evolution

Learning Module

- Load maze configurations for training purposes
- Train an agent to navigate from any starting point to a fixed finish point using customizable training parameters
- Multiple training sessions recommended for optimal Q-table population
- Test trained agents by setting start points and visualizing derived routes
- Save Q-tables for future use
- Reset training data when needed

Installation and Usage

- Navigate to the project working directory: `cd src`
- Install the program: `make install`
- Launch the application: `make open`
- Uninstall the program: `make uninstall`
- Complete cleanup (program and dependencies): `make clean`

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