Car2D AI

Technical Design Document

Artificial Intelligence for Games – A1DIP 2019

Academy of Interactive Entertainment

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# **Summary**

This document contains all details regarding the AI for the Car2D application.

The AI will be created using A\* and will have multiple behaviors. These behaviors will be: WANDER, CHANSE and FLEE. The behaviors are detailed as so:

Wander: Will randomly move around the grid area, moving around blue squares. This is the default.

Chase: Will follow the user’s mouse pointer. This will trigger if the user’s mouse pointer is close to the AI.

Flee: Will move away from the user’s mouse pointer. This will be toggleable via the ‘F’ key.

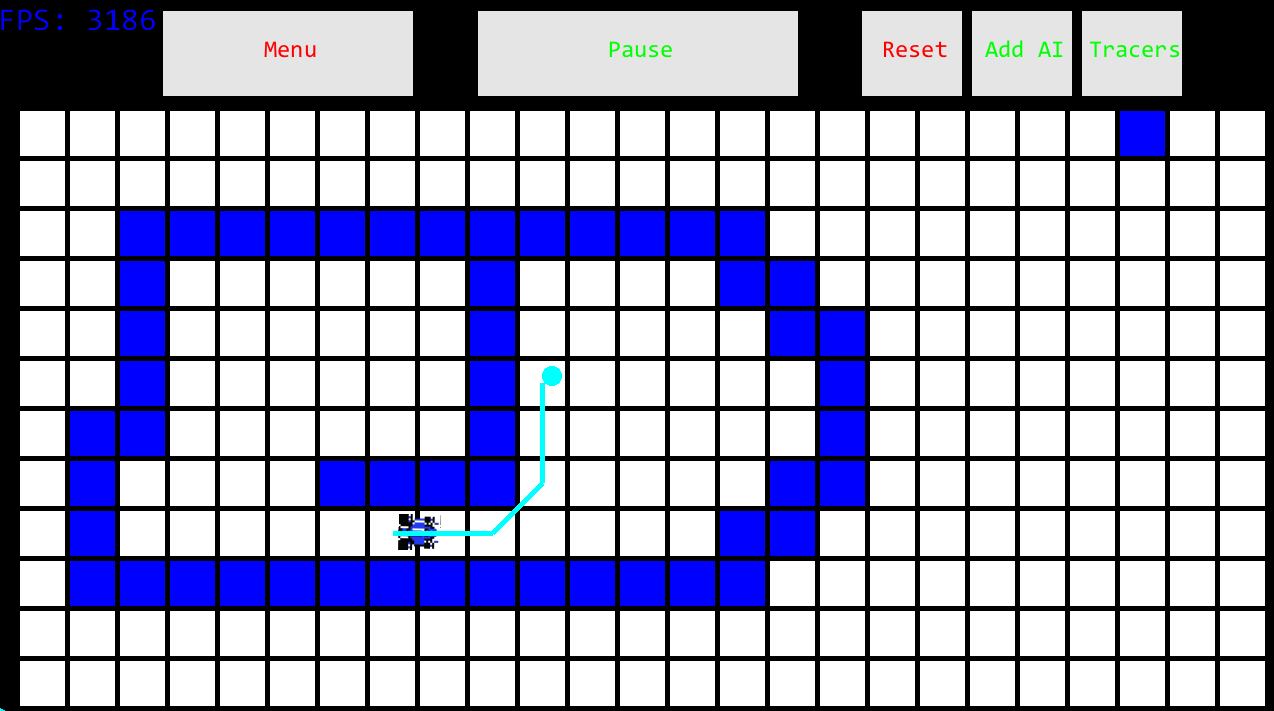
# **Screen Mock-Ups**

## **Main Game Window**

Figure 1. Main Game Window.

As shown in Figure 1, the main game window contains a large grid with a car in the centre. The user can left-click the tiles of the grid to colour them in blue, which the AI will interpret as walls. The user can also add multiple AI to the grid with the max being 10. They also have the option to pause the game to allow for them to draw complex designs while the AI isn’t moving and can also enable and disable tracers. Enabling this will display the path in with the AI will take to reach its destination. The reset button will reset the GameState to its original format and the Menu button will return the user to the menu.

## **Main Game Window Example**

Figure 2. AI shown with Tracers moving around the blue wall.

The AI has been created using an A\* algorithm and works by using the 8 directions within a cube (Node) to find the shortest path. These directions include the standard Up, Down, Left and Right whilst also using each diagonal.

# **Decision Making Techniques**

A finite state machine has been implemented to switch from each game state. There is a Menu State and a Game State.