TCSS 435 - Artificial Intelligence
Assignment 4 - Zombies

Guidelines

This assignment consists of programming work. Solutions should be a complete working JavaScript program including your original work or **cited contributions** from other sources. These files should be compressed in a .zip file for submission through the Canvas link.

This assignment is to be completed on your own or in a group of two or three. If you choose to work in a group this must be clear in your submission. Please see the course syllabus or the course instructor for clarification on what is acceptable and unacceptable academic behavior regarding collaboration outside of a group of two or three.

Assignment

In this assignment you will create an agent controller for an agent in a simple virtual world. The world is a 2-dimensional continuous space (size 800 x 800 pixels). In the world there are three types of agents:

- Rocks - a rock is inert unless thrown. If thrown by a player it travels at a fixed speed (twice the maxspeed of a player) in a single direction until hitting a player, a zombie or a wall, at which point it stops and falls to the ground (or is caught in the case of a player).
- Zombies - a zombie spawns in a random location once every second. A zombie has a maximum speed that is randomly selected between quite slow and the max speed of a player. Zombies ignore rocks but chase players. If a zombie catches a player the player dies (and becomes a zombie).
- Players - a player is controlled by your AI. The player can pick up at most two rocks and may throw a rock in any direction once per second. The player can move in any direction up to a maximum speed.

Approximately 60 times per second your agent will have a chance to select an action. This action will consist of two components: a direction for movement, and a potential throw action. You can move and throw at the same time but you can only throw a rock if you have a rock and only once per second. You should not spend too much time selecting your action as there are other agents in the simulation as well that need to make their move in this timeframe.

Specifications

To create your agent follow these steps:

1. Download the Zombie code from Canvas.
2. Make a copy of the cpm.js file and rename it with your initials (i.e if your initials are ABC call your file abc.js). Use lowercase letters for your filename.

3. In the new file do a "find and replace" for CPM and replace it with your initials (i.e. ABC). Use uppercase letters for your class name.
4. Give your agent a name by changing "Dr. Marriott" to another name. Use your name or another but we want the names of all groups to be unique (and suitable for school).
5. Optionally, you may change the color of your agent from "white" to another color. In testing I will change this color.
6. Alter or replace the code in the selectAction method to create your own agent.

The selectAction method should return an object with these fields:
- direction: an object with x and y component representing the direction you want to accelerate
- throwRock: a boolean that is true if you wish to throw a rock
- target: the zombie you want to throw at (or a location with x, y coordinates you want to throw at)

When creating your code **do not** alter any of the other function with the exception of the constructor (only to add other variables to your agent). Furthermore you may check the state of other players, zombies, and rocks but **do not** change the state of any other object. Be very careful with your code since you might do this in error.

Submission

The following files are provided for you:
- index.html - the base html file
- main.js - the simulation controller
- gameengine.js - the game controller
- assetmanager.js - manages images
- cpm.js - the sample agent

You will submit only:
- abc.js - your copy of the sample agent code where "abc" is your initials