Artificial Intelligence
Main Assignment - Autonomous Computer-controlled Game Characters
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Main Aim of the Game

The overall goal of the game is to survive the game while controlling the main character. There are many enemies which suffer damage to their health the further they are from the centre point of the map. If the player gets too close to any of the enemies, then the player will suffer health damage. The game spawns 50 enemies and a variable is incremented every time one dies. The game is won when more than 40 enemies have died.

Fuzzy Logic

Fuzzy logic is used to calculate the number of health damage to the enemies. The fuzzy logic file "damage.fcl" contains a function block called "damageDealt" which takes in two input variables, the current enemy health, and the average distance to the centre of the map to output the damage dealt. The damage is based on the fuzzy rules stated. The fuzzy logic uses the centre of gravity method and the Mamdani method to calculate the damage. The fuzzy logic is called in CharacterTask.

Neural Network

The neural network has three nodes in the input layer, five in the hidden layer and four in the output layer. The inputs are the health which takes in a value of zero, one or two depending on how much health the enemy has, a sword which takes in zero or one and a gun which takes in zero or one. The neural network is tested and trained on two arrays. The code was taken from a previous lab. The neural network is created in NN. Depending on the result of the neural network, the enemy will either be in a state of panic, attack, hiding or running and different health hits and health gains will be applied to the player and the enemy. The neural network is called whenever the player is in close proximity to an enemy.