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CSC 4301 (01) – Intro. to Artificial Intelligence

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Spring 2022

Bust The Ghost Report

In this project we have been asked to create a game using the game engine Unity to implement the “Bust the Ghost" game. We have created an 8 x 20 grid where a ghost will be randomly placed according to a prior distribution. We also used a uniform distribution at the beginning of the game. Moreover, when someone click on a certain grid a colour will appear indicating how far is the ghost apart from you while changing the probability of all grids. The colour red is for selecting the grid containing the ghost. Orange is 1 or 2 cells away. Yellow, is 3 or 4 cells away. And finally Green, is 5 or more cells away. The probability will keep changing with more clicks to show you where the ghost will probably be. However, if the user exceeds a certain number of clicks, he will lose the game. The user will need to find the ghost before exceeding that limit.

Regarding the scripts used in the project we have implemented 4 main ones.

Game.cs: Which contains the code for creating the grid size and all the main functions of the game. Inside this script we have many important functions such as Place ghost, which chooses a random grid and places the ghost in it. Joint Probability it takes the arguments of the position of the ghost which then returns and displays the probability to the grids. Check Input Grid this function uses The Bayesian equation. The equation we have used is as follows:

P(Ghost) = (JointProbability(colour, distance)*P(Ghost|Click))/P(colour) with P(colour) = Numberofcoloredcells / 90 and P(Ghost)

Therefore, by using this equation it enables us when we get closer to the ghost the probabilities will get higher, if we are far away from the ghost then the probabilities are lower.

Tile.cs: This script contains the variables of the grid.

WinLose.cs: This contains the code that responsible of triggering the winning and losing events.

ProbabilityText.cs: This is the code responsible of the changing of probability after selecting a certain grid giving you an indice on where the ghost will be.

We have uploaded the demo of the game to Youtube:

https://www.youtube.com/watch?v=JpMOuKsYl1Q

To conclude, we have learned in this project on how to use an agent capable of using probability to induce the position of the ghost. The lower the probability the further the ghost is located according to the current grid clicked. Therefore, the user needs to find the ghost before exceeding a certain amount of clicks by following the higher probabilities. The probability of the ghost when revealed becomes 1, therefore, the user needs to click the button “Bust The Ghost” to celebrate his win. This project has been made by: Ahmed AL Hilal and my teammate Yasmine Najd.