3/26/2024

GADE 7321 Part 1

Game Rules and Implementation

Kegan Wade Bennette ST1074145

Table of Contents

FSM Explanation: 3

Full game explanation: 4

Github Repository: 4

References 4

Game Rules:

Our game revolves around capturing flags in a virtual arena where players and AI-controlled enemies compete for dominance. The primary objective is to capture the enemy's flag while defending your own.

Players can pick up the blue flag by interacting with it, which then attaches to their character, allowing them to carry it back to their base. Similarly, enemy AI can pick up the red flag and attempt to return it to their base for points.

If the enemy or player collie into each other while carrying said flags, the flags will drop into the middle of the field and they will have to try to be the first to get to it in order to either pick it back up or have it return o the respective base.

The game implements a scoring system where each successful flag capture earns a point, and the first team to reach a predetermined score, typically five points, wins the match. Additionally, the game employs various mechanics such as player and enemy movement, flag interaction, collision detection, and game management to create an engaging and competitive gameplay experience.

I also have the additional mechanic of jumping and 1st person, I wanted to implement shooting into the game, which is why I have a crosshair.

In terms of implementation, our game utilizes Unity, a popular game development engine, to bring the virtual arena to life. Player and enemy movement is handled using Unity's built-in NavMesh system, allowing characters to navigate the environment intelligently.

Flag interactions are managed through scripts that detect collisions and trigger appropriate actions such as flag pickup and return. The GameManager script oversees the game's state, including scoring, flag status, and end conditions.

UI elements are implemented using Unity's UI system and raycasts, providing players with essential information such as flag prompts and game status. Overall, the combination of Unity's features and custom scripts ensures smooth gameplay and an immersive gaming experience for players.

FSM Explanation:

ChasePlayer: This state represents the enemy chasing the player or blue flag.

It occurs when:

- The player has the Blue flag.
- The blue flag is dropped.
- The player has the blue flag and the enemy has the red flag, the enemy will check what is closer and either try to score point or go get the blue flag.

ChaseFlag: In this state, the enemy goes to pick up the Red flag if:

- The enemy does not have the Red flag and the player does not have the blue flag.

ReturnFlag: This state occurs when the enemy picks up the Red flag.

- This state is active when the enemy has the Red flag and is closer to the Blue flag base (BlueFlagBase) than it is to the player that has the blue flag. In this state, the enemy returns to the Blue flag base to return the flag and score a point for the enemy team.

Full game explanation:

Both players start on either side of the field, the default state for enemy is ChaseFlag(). The enemy will chase the red flag until it collides with it the it will pick it up. The enemy is also constantly checking whether the player has picked up the blue flag. If the player picks up the blue flag the enemy will move towards the player by using he state ChasePlayer(). If the enemy also has the red flag, it will check what is closer (scoring a point or chasing the blue flag) and do that. If the enemy chooses to score it will take the flag back to its base by using the ReturnFlag() state. However if it chooses to return the blue flag from the player, it will chase the player and collide with the player causing the blue flag to drop on the middle of the field, the enemy must now try to get to it before the player pick it back up. If the enemy gets there first the blue flag will then reset back to its original position, however if the player gets their first then the enemy will continue to chase the player. If the player scores then enemy will then check if it till has the red flag picked up, if it does then it will ReturnFlag() if it doesn't then it will ChaseFlag(). The game ends when the player or enemy reach 5 points.

Github Repository:

https://github.com/KeganWB/GADE-3A-7321-Project

References

Kegan, B. 2024. Play Field. [Personal Drawing]. Cape Town: Unpublished.