Computer Games Development CW208
GDD
Year IV

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Game Overview

My project ius 2D sci-fi themed space game where a player can build their own ship and space station and explore procedurally generated enemies base to fight space pirates. Each enemy space station is generated using a Delaunay triangulation and minimum spanning tree to create realistic connections between rooms.

NPC make Realtime decisions using their decision tree system. With AI Logic like attacking, dodging and patrolling.

The base modification takes place a gird bases world where also the NPC used their pathfinding agent to navigate the procedurally generated space stations.

Feature Set:

- Spatially partitioned grid world
- Tile Editor to delete and assign tiles for base
- Ship Editor to create your own ship to fly to enemy space stations
- Custom Decision tree for enemy NPCs
- Dynamic mini map showing objects and station layouts
- Procedural Generated enemy space stations
- Shooting gameplay with particle effects
- A* pathfinding.

Rendering System

Rendering Is done through SFML 2D based rendering. Animated entities sprites are managed by the Animator who loads in all the textures using the Loader singleton.

Rendering is also managed at times by the Movable Camera class who tracks the player or is moved via the mouse at times.

Another layer of rendering is taken care of by the Mini map who renders a bigger portion of the game world on a smaller screen in the corner and translates GameObjects into icons.

Game World

Game world is made up modular space station built on grids. The player begins at their own space station and can travel to these other procedurally generated enemy space stations. This grid-based stations are built on cells and nodes which the NPCs used to navigate and Gamobejcts like bullets use to check for collisions.

Gameplay

- Build and customize your own space station.
- Create a custom ship and travel to enemy space station.
- Defeat enemy space pirates using guns.

Game Engine

The game engine is built up on C++ using SFML. Following scene based architecture where each scene is self-contained

Core Systems used throughout:

- Decision tree for AI
- Grid system for special management
- Custom written math and utility libraries
- Pathfinding agent
- Resource management like the Loader and various libraries.

Weapons

Weapons are managed through a Weapon base class with derived classes like Shotgun and MachineGun, each having their own firing patterns and cool downs which are synched to the animations. Projectiles include visual effects such as particles.

Game Characters

NCP wander the player space station while enemy NPC patrol theirs and attack the player should they encounter them; the decision tree allows for them to doge on coming player bullets and attack.

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