
Final Project

CMP_SC 4610 - Computer Graphics I

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Implementation

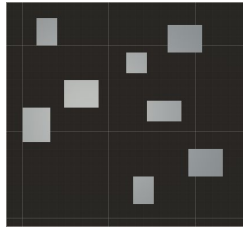
Dungeon Generation

The Dungeon Generation was completed in 6 parts:

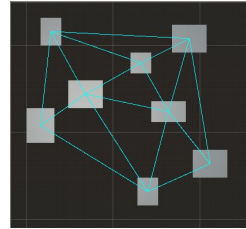
- Placing Rooms
 - Delaunay Triangulation
 - Trimming the Graph
 - Pathfinding Hallways (A*)
 - Building the Dungeon
 - Populating the Rooms
-

Dungeon Generation: Steps 1-4

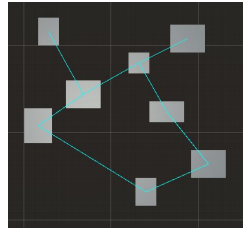
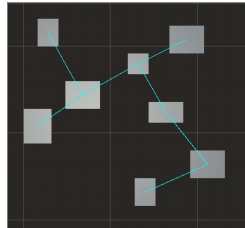
1.) Placing Rooms



2.) Delaunay Triangulation

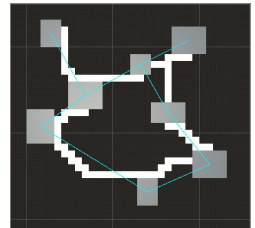


3.) Trimming Graph

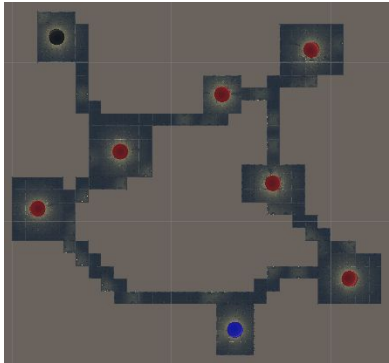
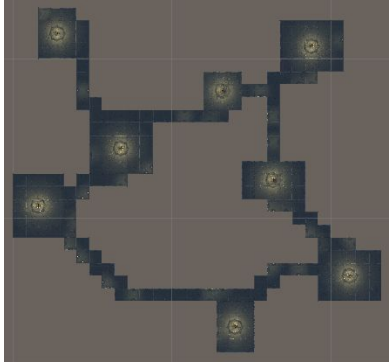


4.) Pathfinding Hallways (A*)

- +Distance to End
- +10 for Room
- +5 for None
- +1 for Hallway



Dungeon Generation: Steps 5-6



5.) Build Dungeon

- Place Room Prefabs
- Place Wall if None to the
 - Up
 - Down
 - Left
 - Right
- Place Lights

6.) Populate Rooms

- Select Random Boss Room
 - Must be End Room
 - Select Random Spawn Room
 - Instantiate Boss Spawner
 - Instantiate Player Spawner
 - Instantiate Enemy Spawner
 - Leftover Rooms
-

NavMesh Generation

Using Unity Technologies NavMeshComponents package, the Room prefabs had a NavMeshSurface component put on them that would be backed during runtime.

This allowed for a NavMesh to generate during runtime. This would 0.5 seconds after the scene loaded so that the dungeon was fully generated.

Game Sandbox 1

The Player can move around the dungeon and attack enemies

- Move | WASD
 - Change Weapons | 1 (Sword) 2 (Gun)
 - Sprint | Shift
 - Jump | Space
 - Attack | Click
 - Crouch | Control
-

Game Sandbox 2

Enemies will chase the player around and reduce health if they touch the player.

If the player's health is reduced to zero, they go back to the Main Menu.

Game Sandbox Methods (Player)

Player movement is implemented using a free, open source asset from the Unity store.

Weapons are child objects to the player, with scripts defining their functionality.

A canvas is projected onto the screen at all times showing the player's health, which is increased and decreased according to a script on the player.

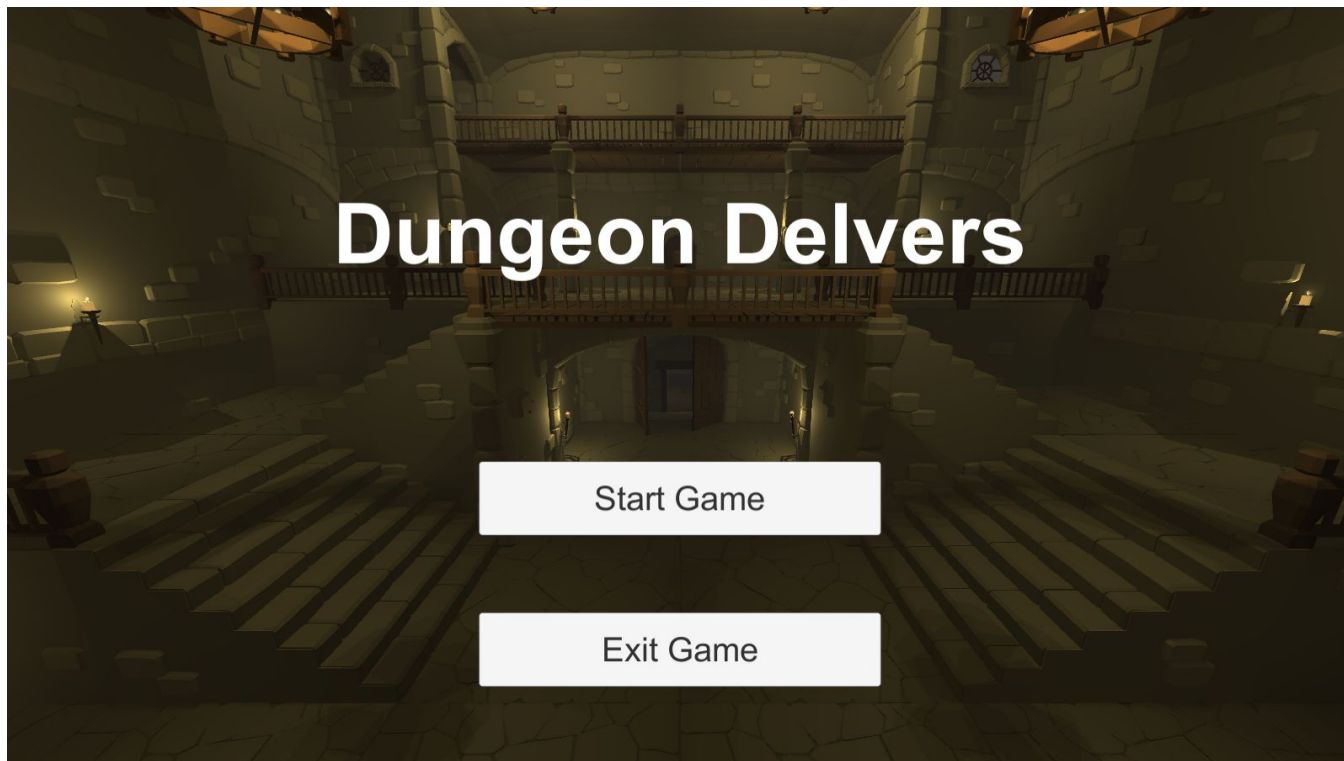
Game Sandbox Methods (Enemy)

The enemy follows the player using the NavMesh system in the Unity Engine. In the enemy script, the player Transform component is given as a destination, which allows it to move towards that position if they are within range.

The enemy has health that is reduced on contact with the player sword or bullets from the player gun.

Final Build

Main Menu



Initial State of Game



Enemy Room



Boss Room

