

TownCount Remake: 2D Metroidvania Game with Shader Effects

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Abstract—This is the final project in the Interactive Computer Graphics courses. I am going to make a 2D Metroidvania game. The main character has to pass through different terrain and defeat monsters. I will apply multiple shader effects and lighting in this game to make it look more fashionable. Similar games are Hollow Knight, Mario, and Rockman.

1. Libraries and Material

Only use OpenGL for the Graphic programming(glm, glfw, and glew libraries) to make a 2D game engine from scratch. And use the characters and the stage sprites from my previous project.



Extra libraries: 1. The stb library to load png and jpg files. <https://github.com/nothings/stb>

2. The json library to load JSON files. <https://github.com/nlohmann/json>

Maybe there will be more extra libraries later on.

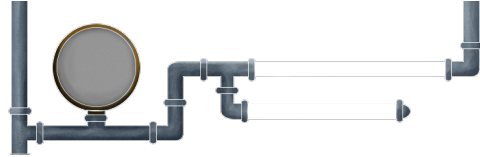
2. Tasks

These are the tasks I will try to attempt.

2.1. 2D Animations

1. Show the animations of the characters and monsters using glBindTexture and splitting UVs. The animations I want to achieve are: Idle, Run, Jump, 3 Chain Attack, Jump Attack, Damaged, and Died animations.

2. HP bar and other UIs.



2.2. 2D AABB Collision Applies to Game Mechanics

Not only have to detect whether multiple rectangles are collided, but have to check which side has been collided: left, right, top, or bottom.

1. The character can interact with terrain or even jump on a platform from its bottom.

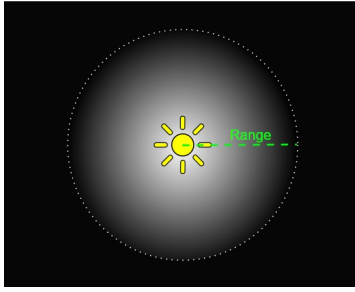
2. The character can attack monsters, and be hit by monsters.

2.3. 2D Light and Shadow

1. The light source came from the main character and lighten the surrounding, aka 2D Dynamic Raycast shadow light.

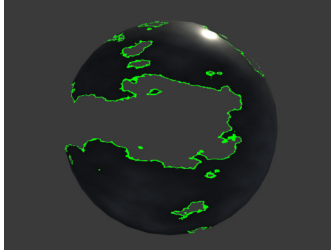


2. lamp light in the background. Point Lights around the center.



2.4. 2D Shaders: Dissolve Effects

1. Apply to dissolve effects on the characters and monsters when defeated. Write a shader that can dissolve 2D sprites over time till the sprite completely disappear.



2.5. Extra tasks

1. If I have time I wanna make a menu and a special ability for the main character. His special ability is that he can use a rope to pull himself to the terrain, or even pull a monster closer to himself.

2. Full-screen shader, the whole screen will display a Blur Shader effect with shaking when attack the enemy or being hit.

3. Other shaders like attack shine effects.



3. Suggested Grading

I want the 25+15% of the grading, simply because I will make a game alone. I have 4 basic tasks, each for 7%, and the other 12% for the extra task and the complexity and completeness of the whole game.