T1. Own OpenGl Game

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0. Brief intro about Game

We set the default setting for the game to exploring the universe until we find a habitable environment because of the radiation on Earth.
They are attacked by unknown cosmic materials while exploring space in a spaces hip. So basically, to win the game, getting rid of the stones before the spaceship h itted by the flying stones is the condition to win the game.

1. Title Screen

We make title screen, with game title and 'Press Enter'. when player press ente r, game will start.

2. Help with f1 key

We set 'f1' key to see Help Screen Whenever key pressed.

3. Reset with r key

We set 'r' key to reset Whenever key pressed.

4. Multiple difficulty levels

We set easy, normal, hard mode. Player can choose after title screen, or restart the game.

5. Shading

We make shading with blinn-phong model.

6. Resizable window and its constant aspect-ratio viewport

We set initial window size '1280, 720' and make aspect-ratio 16/9. When resize window, the ratio will be maintained.

7. Text Rendering

We make text rendering in all screen. and while playing game, player can check total kill, death count, skill count in screen.

8. Sound Rendering

We use irrKlang source to make Sound Rendering. We use background music, kill sound, skill sound, and shot sound.

9. Textured 3D skybox/cylinder/sphere

We make skybox to make Background image, and make sphere Texture with own image to make Skill ball.

10. Dynamic 3D camera movement

We make Dynamic 3D camera movement using Mouse Left button. Player can change view using scroll mouse with press left button, when release camera view set origin. And make zoom effect with mouse right button.

11. Your own hand-drawn images

We draw own image to textured 3D Skill Ball.

12. Particle systems

We used the particle system to show a short particle when we killed enemies.

13. Your own physics simulation

When the spaceship shot, we implemented a simple physics engine.
It felt like there was a slight rebound. y,z coordinates were moved in the direction of the camera eye, considering the direction the spaceship shot and then moved back to the original coordinates.

14. Moving 3D NPCs with AI

We make 3D object (initial position is Random) and make it moving toward spaceship. when it crash with spaceship, life is decreased. and spaceship hit and kill the object, kill count increased. And make skill ball with sphere shape. when player hit this skill ball, player get 1 skill count.

15. Not Machine dependent.

We use glfwGetTime function to make game not machine dependent run speed. we set frame difference 0.016.

16. Deformable 3D character animation

When changing the View with the left mouse button, the angle of the spacecraft was also considered, and rotate matrix was applied to make it look appropriate to the scene.

* Source From:
3d obj file: https://free3d.com/3d-models/
skybox image file: http://pngimg.com/
sound effect: https://www.youtube.com/watch?v=5986wJdFS9o
image file: http://pngimg.com/

* Use assimp-loader, particle struct, sound rendering opensource, texture renderin g file in cg.skku.edu