CS550 Final Project Report

The 3D Scenes of Star Wars

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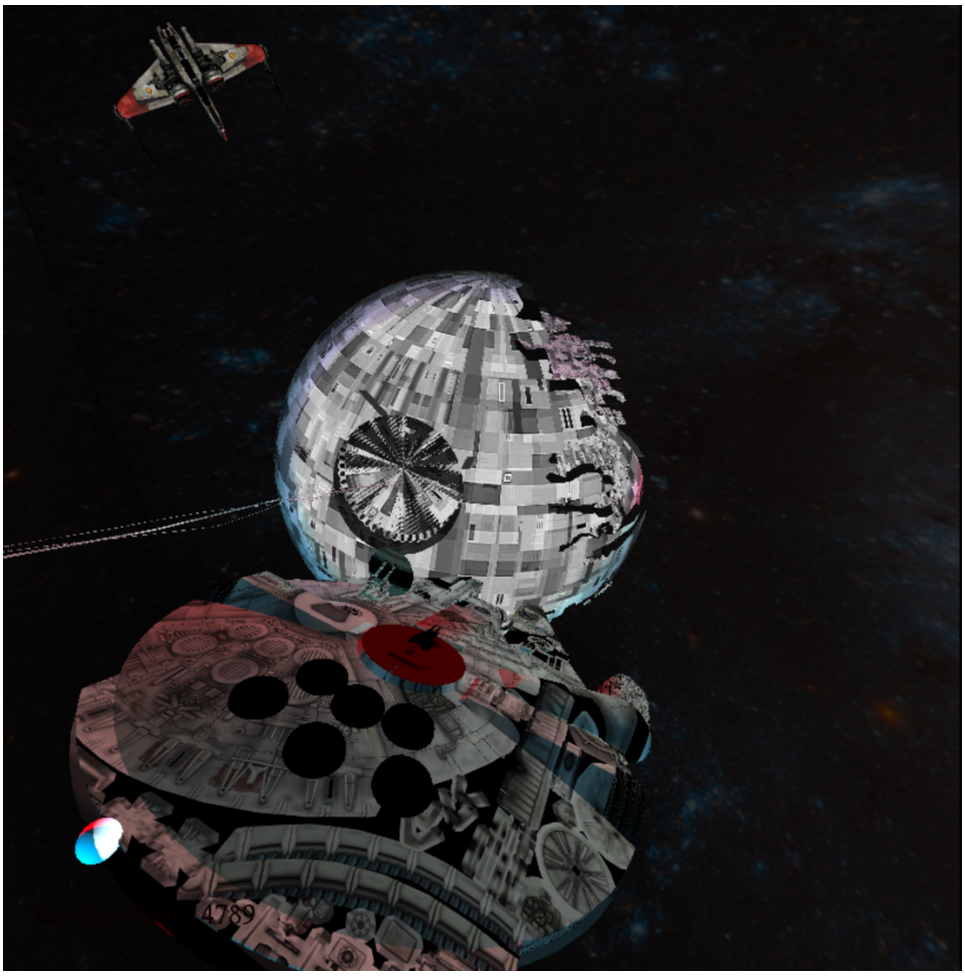


Introduction

In the final project scene, the Death Star of the Empire is fighting the two spaceships of the Resistance. First, there are dead stars and two spaceships in the scene. Second, the universe consists of a sphere of starry texture. Third, different lamps achieve the light efficiency of the spacecraft engine and the light efficiency of the weapon. Fourth, the battle scene is dynamic. Fifth, we can see some laser light.

Proposal

In the Final Project, I want to create a project with a Star Wars movie theme. In this topic, I want to load the Millennium Falcon model, the Death Star and The Force Awakens model to create a battle scene (with textures). For making up the entire universe, I can use the texture of the universe mapping in the inside of the cube. This makes us feel surrounded by the universe. I think it is very difficult to complete the scene on the picture. I will simplify the light effects of some spaceships and bullets. And I will do some animation to make the spacecraft and bullets move.

1. Load .obj mode to the project by using hint in class website.
2. Map the texture to the objects.
3. Transformed and rotate objects to correct places.
4. Set lights for the Spaceship weapon and engine.
5. Set animation for the Millennium Falcon model and Death Star. Make the scene like battle.
6. Create the Skybox. It is a (large) cube that contains the entire scene. It contains six images of the surrounding environment. That is the universe.
7. Set the position of the eye.

What I did in the final project

I have done some of the things involved in computer support and courses so far. It doesn't look as exciting as in proposal, but I think it's good. I implemented most of requirements in proposal. However, Skybox involves many complex shaders, so I used simple textures to create cosmic scenes.

Here are some details to illustrate what I did：

1. Death star and two spaceships

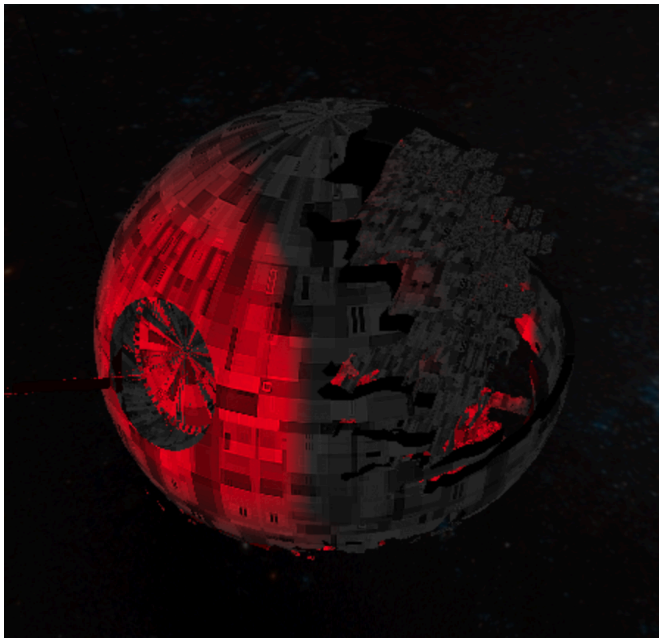


Figure1: Death star

Figure2：millennium-falcon

Figure3: Arc-170

As shown in Figures 1, 2, and 3, I used the method provided in the course to import the ships .obj file into the project. In addition, I narrowed them down, rotated them and placed them in the right place. At the same time, I added textures to them, which made them look more realistic. Not every . obj file has a suitable image. I have been looking for a long time to find the right image. In the proposal, this scene is a demonstration of Microsoft's design for the game. I don't have the same image as the texture. This caused my project to look different from the proposal.

2. Background setting

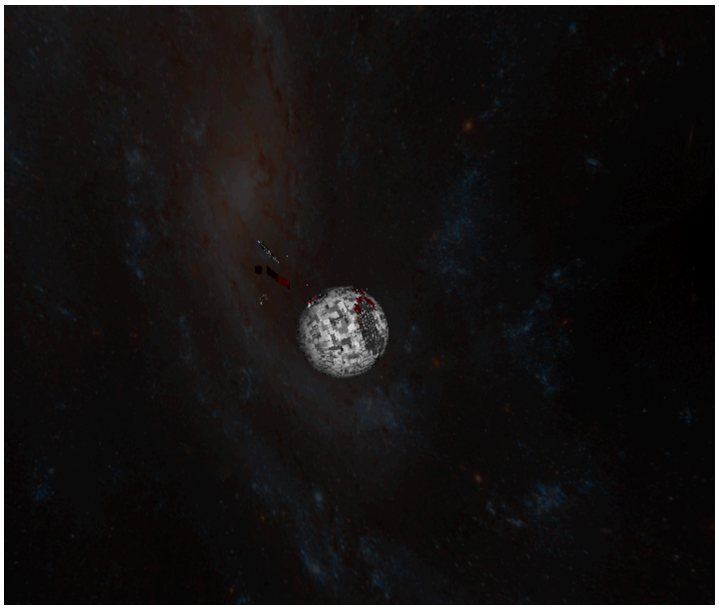


Figure4: Background

As shown in Figure 4, in the background, I use a sphere to include all the items. The sphere has a texture with the star sky pattern, so the entire background looks like all the items are in the universe. When the scene is rotated 360°, the scenes seen are all starry sky. There is a problem here, the light effect does not light up the background, so the whole scene is a little dim. This led to the darkness of the laser light.

3. Millennium-falcon engine and light effect settings

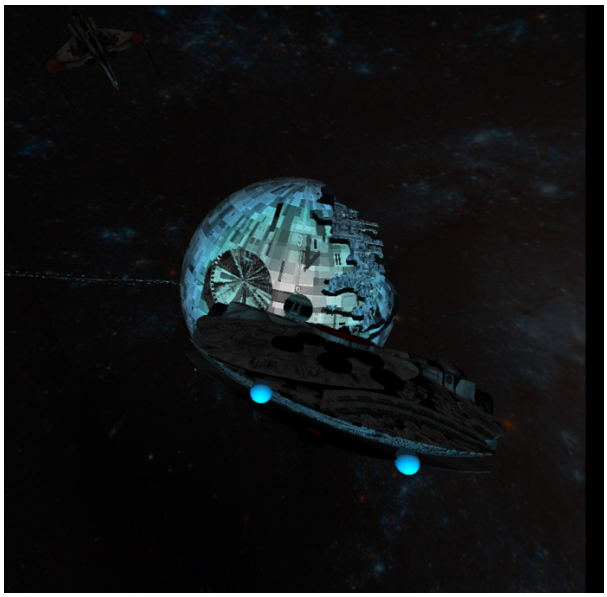


Figure4: Engine Light

Since I don't know how to set up a light strip, I installed two spheres on the engine part of Millennium-falcon to represent the engine. As shown in the figure, when the engine light is on, the engine will illuminate, and the star will have a corresponding effect. Setting up the light is simple, but it is difficult to get the light to illuminate the corresponding object and find the location where the light is placed.

4. Weapon ray and light setting

As shown, I created four Bezier Curves as weapon rays and added light effects to them. I set up 6 lights to show the light of the ray and the engine. The color of the Curve is red, and the color of the ray cannot be fully displayed due to the dimness of the entire background. Even if I created a light effect for it, it still can't light up.

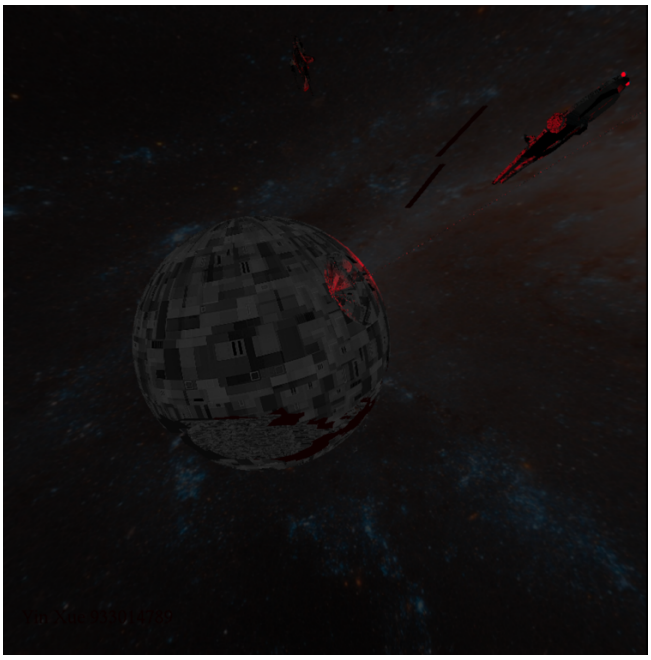


Figure5: Ray Light

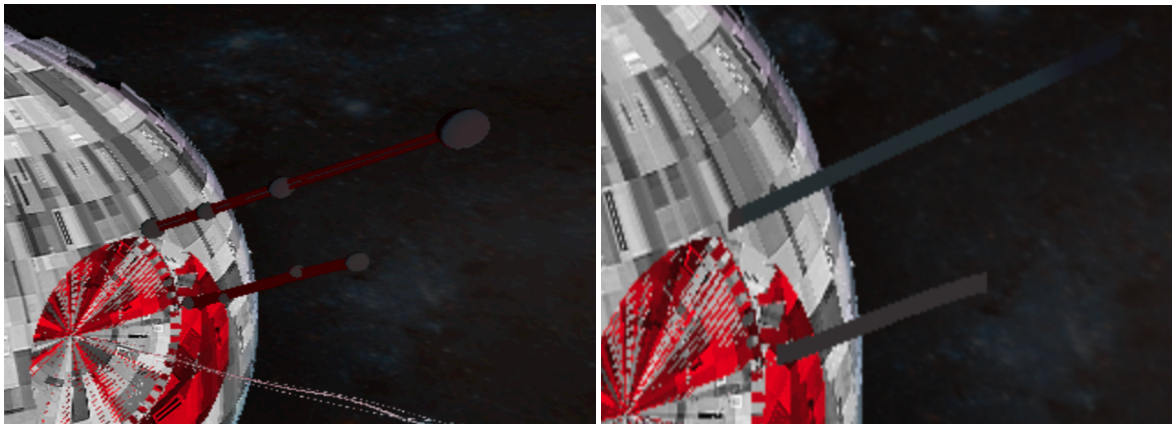


Figure6: Ray Light

5. Animation setting

The main function of the animation is to make the project move to achieve dynamic effects. In final project, I set the rotation animation for the Death Star. The two ships flew in different directions to avoid the rays of the enemy. The two rays I designed were sent by two spaceships that were about to hit the enemy. The

whole animation is not complicated, but due to the complexity of the obj file, my computer's GPU can't fully load the animation scene. This caused my project to look very stuck.

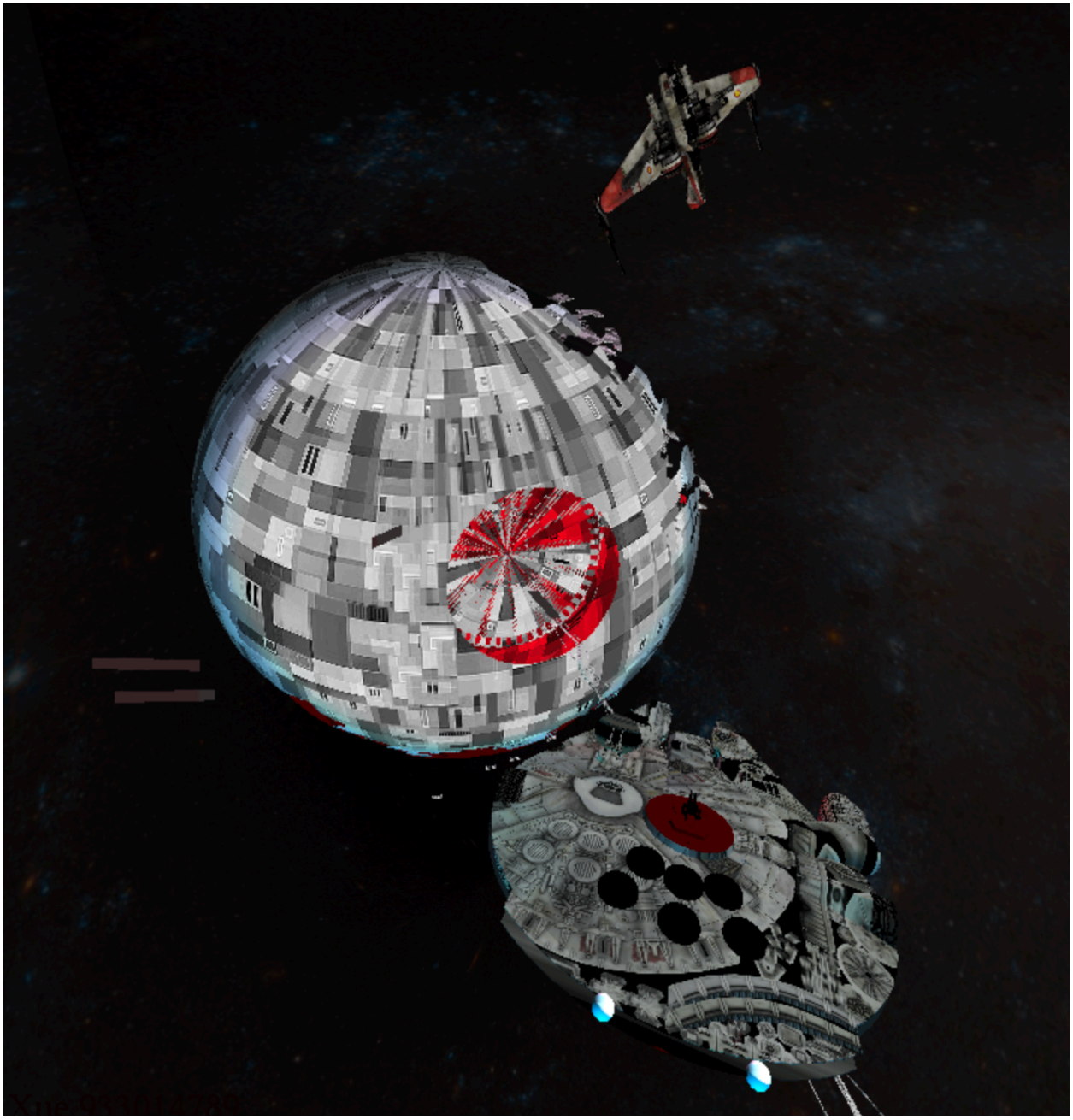
impressive cleverness

It is hard to get a good project. First of all, we need to have an idea. If there is no idea, then the follow-up work cannot be carried out. Second, when I really start working on a project, I will face many difficulties. For example, the problem of making a light strip and the problem of the dark background. These problems will not occur at all before the actual operation. Third, spatial coordinates are an annoying problem. When I'm making rays and engines, finding the location of the rays and the engine is a problem. Fourth, light efficiency is a wonderful effect. There are many factors to consider when setting up a light effect. For example, the position, direction, color, etc. of the light. Good light effects can make the scene look great. This course covers sunlight, point light and point light, but how to make different types of objects shine themselves is a question worth pondering.

What I learned from doing this project

I have some insights in this course. When we learn a single component, we tend to use it easily. But if we combine many components together, there will be many problems between them. In the project, I have combined many components together, and there are many problems between them. I have never been exposed to OpenGl before this class. Now I understand how to create a model myself and how to add texture to the model. Light effects are wonderful things. I learned to add light effects to my model. Animation can make my model move, which adds to the fun of creation. I think the content of this course is very rich and interesting. This

knowledge allows us to get some initial understanding of OpenGl usage. This allows us to create some simple mini-games and complex large 3D scenes.



Video Link: https://media.oregonstate.edu/media/t/0_s2piamoe