Max Gilhespy CS-330 Project Reflection

Design decisions

Development Choices

When I began this computer graphics and visualizations class, I had no preconceived ideas about any 3D scenes to create through programming. The way I decided what my own 3D scene should look like was from recognizing that it makes sense to use objects that are a simple combination of basic objects. I realized that some of the things that I had bought for my cat were good candidates for objects in a 3D scene, so I put 4 items together and took some pictures to refer to.

I put consideration into placement as I believe a scene should look interesting or visually appealing. Because of that I took one of the balls out of one of the toys and placed it on the ground alone. I did this to show clearly that the blue toy could be seen as an object made from many objects.

After creating the scene, I felt the best way to program would be in a modular way so that everything would remain organized. This made it easy to find any programming aspects which I wanted to work on. There are many header files along with source files and all are named appropriately. I chose names such as light, shapes, shader, texture to make it clear which area took care of what feature.

The program is reusable. The shapes header file contains data for creating the basic shapes which are used to make more complex objects. The cat area source file contains functions for combining basic objects. The cat area source file is for objects relating to cats. Another header and source file appropriately named could be created for any type of complex object group.

Navigation

For navigation I programmed movement on the usual known keys, w, a, s, d, for the user to be able to move forward, backward, left, and right. I did this because these are the keys which most people are familiar with and will naturally go to when wanting to move a character, move in a scene, etc. There is the addition of the q and e keys which allow for movement directly up and down. The view from the camera is controlled by mouse movements so the user is able to have a full 360-degree view of the scene and can navigate to any part that they choose to. The middle mouse wheel can be used to speed up or slow down the rate at which the user moves when pressing one of the movement keys.

Custom Functions.

I added the ability to choose either perspective view or orthographic view. This is easily interchangeable and can be done at any time by pressing F11. Another addition was with the lights. There are two lights in the scene of differing strengths, and I made it so that the lights spun in a circular way around the scene. This was a fun way to let users see the different textures in the scene and the way the textures react to light. The specular highlights from the plastic balls are particularly nice.

I have included a couple of screenshots so that you can see a perspective view and an orthographic view.

Please go ahead and explore the scene further by navigating to CS-330\CS330-ShowcaseApp\x64\Debug\CS330-ShowcaseApp.exe

Here is one of the original photographs of the scene.

A dog bed and toys on a wood floor

Description automatically generated

Perspective view of 3D model

A table with objects on it

Description automatically generated

Orthographic view of 3D model

