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CS 330

12/15/2024

Final Project Reflection

For my original image I used an AI generated image of various geometric shapes that were untextured and without context. I made that decision in order to give myself the most freedom with scene recreation, as I had essentially a blank slate when it came to the textures that could be applied. In the end I decided to model the 3d scene after various real-world objects that matched the shape of the objects in the 2d reference image. The reference image also included some complex geometric shapes that were necessary for project requirements. While only one complex shape was required, I tried to challenge myself to do two. One was the house, which was made up of three shapes total, while the other was a mug which was made up of two shapes. The other three shapes in the scene were simple shapes bringing the total to five.

The five 3d objects I selected from the reference image were a house, a mug, a cylinder, a sphere, and a square base pyramid. The mesh existed in the program for everything I would need to create these objects. The house was a combination of two boxes and a square base pyramid. The mug was a combination of a cylinder and a torus. The sphere, square base pyramid, and cylinder by themselves were all simple existing meshes. Each 3d object was assigned with different materials and had textures applied to them to make them look like real world objects that would make sense in the context of the shapes. For example, the lone cylinder is textured as a log and the mug had both the cylindrical and torus components with a porcelain texture. I had to define each material and texture in the code within the DefineObjectMaterial and CreateGLTexture methods. The materials used for the objects were necessary for the lighting that I added to the scene to be visible.

The SetupSceneLights method was used to add two light sources to the scene. The first was a directional light source to emulate something like sunlight over the entire scene. The second was a point light source intended to have a brown tint that was supposed to callback to the brown background of the reference image, though this admittedly did not come through in the final project. The lighting is visible from all angles on the scene, as the user can move the camera position to view the scene from anywhere in the program. This camera movement is done using the WASD keys for directional input and mouse movement for rotational input. The user can also use the Q and E keys to raise and lower the altitude of the camera without moving in other ways. The speed of the camera panning can be increased and decreased with the mouse scroll wheel.

The program is made modular and flexible in nature by rendering the 3d shapes separately in the RenderScene method. The sample program from module 1 used a different method for each of its rendered shapes, which meant that any changes to the scene would require changes within each method. Being able to simply add meshes and their properties to my RenderScene method allows for any changes to the scene shapes to be made in one method. I can add or remove shapes as necessary which keeps the code modular and easy to understand. Materials can also be added and changed as necessary within the DefineobjectMaterial method that I added as used in the module six assignment.