Juan Rodriguez

12/21/2024

CS 330 Final Project Reflection

When I started working on my 3D scene, I wanted to focus on creating something that felt realistic and relatable. That’s why I chose objects like a table, books, a coffee mug, a pencil holder, and a monitor. These are all things you might see in a workspace, and they allowed me to experiment with different shapes, materials, and textures. Each object presented its own challenges, but I felt that together they formed a cohesive scene that was both visually interesting and functional.

Programming the required functionality was definitely a learning experience. For example, I spent a lot of time fine-tuning the lighting so that every object was properly illuminated. I also carefully defined materials and textures to make each object feel unique. For instance, I added custom materials like red leather for one of the books and lime plastic for the pencil holder, which gave me a chance to play with how light interacts with different surfaces. I wanted the scene to have a balance of realism and creativity, and these decisions were all part of achieving that.

Navigating the scene was another area where I put in a lot of thought and effort. I set up controls that let the user move the camera horizontally, vertically, and along the depth axis. The WASD keys allow movement forward, backward, left, and right, while the Q and E keys handle upward and downward movement. This way, users can explore the entire scene from different angles and really take in the details of each object. To make the navigation feel even smoother, I added mouse controls for adjusting the camera’s orientation. The mouse cursor lets you look around by changing the pitch and yaw, while the scroll wheel adjusts the movement speed. This means you can either glide slowly to admire the objects up close or zoom around quickly to get a broader view. I also made sure to include both perspective and orthographic views. With a single key press, you can switch between them, which adds another layer of flexibility to how you explore the scene.

One thing I’m really proud of is how modular and organized my code turned out. For instance, the SetShaderMaterial function makes it easy to apply specific material properties to any object in the scene. Similarly, the SetTransformations function handles scaling, rotation, and position all in one place, so I didn’t have to repeat that logic every time I added a new object. These functions not only saved me time but also made the code much easier to read and debug. Adding the camera controls and navigation features was definitely a challenge.

I wanted to make sure the scene felt immersive and easy to explore, and I think the combination of keyboard and mouse controls achieves that. Being able to switch between different views also adds a lot of versatility, whether you’re examining a single object or looking at the scene as a whole. In the end, I feel like all these design decisions came together to create a 3D scene that is both functional and engaging. The objects, materials, lighting, and navigation all work together to make the experience feel complete. I’m happy with how it turned out, and I learned a lot along the way.