Aeriel Denmark

CS 330 – Computer Graphics and Visualization

Shaykhian – Final Project

\***due Sun 2/23/25**\*

**Design Decisions**

For my 3D scene, I created a desk setup that includes a table surface, a computer monitor with a stand, a keyboard, and a mug. My goal was to make the scene simple but visually appealing while meeting all the project requirements. I used basic shapes to build the objects in the scene. The table was represented using a large plane mesh, and I applied a wood texture to give it a natural look. The monitor was created with a box mesh, and I used a cylinder and a box to construct the stand. I kept the monitor a light color to resemble an actual screen. For the keyboard, I used a thin, wide box mesh and colored it a dark color to contrast with the table and monitor. The mug was made with a cylinder for the body and a torus for the handle. I applied a ceramic texture to the mug to give it a smooth finish and added a coffee logo texture to the handle for extra detail.

Lighting played a key role in making the scene look realistic. I used two types of lights: a directional light and a point light. The directional light simulates overhead lighting and casts soft shadows, while the point light adds brightness to the objects on the table. I adjusted the ambient, diffuse, and specular settings to ensure the lighting was balanced. The table has a lower shininess value to reflect its wooden material, and the mug and monitor have higher shininess values to show their smoother surfaces.

For navigation, I added the ability to switch between perspective and orthographic projection modes using the “P” key. The perspective view provides a realistic 3D look with depth, while the orthographic view is helpful for checking object alignment without distortion. This feature adds interactivity and meets the requirement for different viewing options.

I kept my code organized by including descriptive comment lines to make it easier to read. I created functions to handle object drawing with either textures or colors, which helped when I added new objects. The lighting setup and projection toggle were also placed in separate functions to keep the main code clean.

One challenge I faced was positioning the objects correctly for them to sit on the table surface. I had to adjust the Y-axis values to avoid objects floating above or sinking into the table. Another challenge was getting the textures to scale properly, which I fixed by using a 1024x1024 resolution texture and adjusting the UV mapping. Finding the right lighting balance also took some trial and error.

Overall, I learned how small details, like lighting and textures, can make a big difference in making a 3D scene look realistic. I also gained experience in organizing code and working with projection modes. I am satisfied with how the result of the scene and feel like I accomplished my goal of creating a simple desk setup.

**References**

LearnOpenGL. (n.d.). *Getting started: Textures*. <https://learnopengl.com/Getting-started/Textures>

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