Dylan Stirling

Professor Wabara

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Design Decisions

The 3D scene consists of a monitor screen, monitor housing, monitor support, monitor base, table, keyboard, mouse, mouse roller, and a cup. These objects were selected to create a realistic representation of a typical desk setup as shown in my project proposal picture. The monitor screen is represented by a flat plane, the monitor housing is a box primitive, and cylinders were used for the monitor support and base. The tabletop is depicted by a large plane, the keyboard by a primitive box, and the mouse and its roller by spheres. The cup is represented by a tapered cylinder. By using basic shapes, we minimized complexity and kept the polygon count under 1,000 triangles for each object, ensuring efficient modeling while maintaining realism.

The program was structured to load textures, define object materials, set up scene lights, and render the 3D scene. Textures with resolutions of 1024 by 1024 pixels or higher were carefully selected to enhance the realism of the objects. Two light sources were added to the scene: a main light source and a warm light above, providing general illumination and a realistic lighting effect. The Phong shading model was used to create realistic lighting and shading effects. The placement of objects was carefully managed using X, Y, and Z coordinates to ensure their correct positioning relative to one another, enhancing the overall realism of the scene.

Navigation of the 3D scene was implemented using the WASD keys for movement and the QE keys for upward and downward movement. The mouse cursor was used to adjust the camera's orientation, and the scroll wheel to control the speed of the camera's movement, offering users an intuitive and flexible way to explore the scene from different angles and distances.

Works Cited

Inc, T. K. G. (n.d.). *The industry’s foundation for High Performance Graphics*. OpenGL.org. <https://www.opengl.org/archives/resources/features/KilgardTechniques/oglpitfall/>