Final project

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CS330

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Throughout the development of my 3D scene, I carefully crafted a digital twin of my personal workspace, complete with objects like a desk, lamp, computer monitor, arm stand, desk mat, and my laptop. This approach not only made the project personally significant but also aimed to immerse viewers into a familiar, functional setup that many can relate to. The choice of these specific objects was driven by their everyday presence in my workspace, and implementing them in 3D helped refine my skills in creating realistic and functional digital environments.

The development choices for my 3D scene were largely influenced by the desire to replicate my actual desk setup. This decision provided a personal touch and allowed me to work with objects that I am intimately familiar with. Programming for the required functionality involved breaking down each object into basic geometric shapes and then combining them to form more complex structures. For example, the desk lamp was constructed using multiple cylinders and boxes to accurately represent its different parts.

Navigating through the 3D scene is designed to be intuitive and accessible, accommodating both new and experienced users. The navigation system employs GLFW for handling keyboard and mouse inputs. The 'WASD' keys facilitate movement within the scene, while the 'QE' keys allow for vertical adjustments. Moreover, the mouse controls the camera's orientation, offering a dynamic exploration experience. The scroll wheel adjusts the movement speed, enabling precise control over the navigation, which is essential for a detailed inspection of the 3D environment.

In terms of code organization, my project employs several custom functions to enhance modularity and readability. One key function, RenderScene(), handles the drawing of all objects within the scene. This function includes setting up custom textures, defining lighting parameters, and creating complex shapes from simpler primitives. The RenderScene() function streamlines the rendering process by organizing all draw calls and transformations in one place, making it easier to maintain and expand. This modular approach underscores the importance of organized code in managing complex 3D scenes, enhancing both readability and reusability for future projects.

From a reflective standpoint, while I successfully implemented two light sources, the minimum required for the project. I had hoped to integrate more to enhance the scene's aesthetics further. Understanding and manipulating light sources within a 3D environment proved to be both challenging and educational, highlighting the impact of lighting on the perception of space and material properties. Additionally, I encountered some uncertainty with the orthographic and perspective views. Despite this, the project was an enriching experience that significantly improved my proficiency with 3D object creation and scene management, sparking a deeper interest in exploring more complex 3D graphical representations and interactions.