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CS-330 Computational Graphics and Visualization

Final Project Reflection

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When we first started this class and were asked to submit a proposal for what would eventually become our final project of the course, I turned to my desk and looked for items made up of the simple shapes we were given examples of. For my main complex object, I chose an origami crane as I could envision it composed of 3 of our simple shapes planes, pyramids, and cubes. The remainder of my objects were a bit simpler but met the requirements of using at least four of the six simple shapes we were to include in our final project. Looking back, I’m very happy with the way my scene turned out. I really like the shapes and layout. If I were to do it again, I would choose similar shapes, but I think I would have gone with more of a theme. I would incorporate Japanese artwork and themes to complement the paper crane as opposed to the random collection of desktop objects. For my final rendering I took the creative liberty of replacing the white texture of the plane (desk) with a light bamboo floor texture. I believe this really enhanced the overall look of my scene. But all other objects I kept true to my original photo.

We can navigate the 3d world I created with a combination of the mouse and keyboard. The mouse can be used to change the camera angle or direction that the camera is pointing. While the keyboard is used to move the x, y, and z position of our camera, or its location within our scene. We also added the functionality of camera speed to our mouse scroll wheel and created both perspective and orthogonal views that could be toggled between using the “P” key on the keyboard.

The functions developed for cameral controls and lighting were completely modular and easily movable between projects. Once they were developed in the pyramid projects, they were very easy to incorporate into my final project build. One of the main challenges I encountered in this course was rendering multiple items in separate VBA and VBO objects. Early in the project this held me back quite a bit. I knew I could render multiple objects in place but texturing multiple objects would be a challenge if they were in the same buffer array. After reading through the book materials, I saw an example of a mipmap, and this gave me the idea to create a custom texture composed of all the textures I would need for my project. I could them map different objects in my scene to different areas of my texture map. Once this worked the last challenge would be to render my cylinder without using one of the create a cylinder library functions. But I was able to do the math to calculate the radius points to render my cylinder in place. This may have been a longer and more time-consuming approach, but I was moving forward past the roadblock of multiple buffer arrays. It also gave me much more insight into how these complex objects are built using triangles and the math behind it. I don’t think I would have taken that away had I used a library function to render one. Ultimately there was no need to move my objects throughout the 3d space once placed so I didn’t revisit making it work with multiple buffers. But all my objects are clearly labeled and organized so it would be easy to modularize them if needed to move between projects. While this was not the most conventional way to complete this project, I’m happy with the results and believe I have met all criteria of the rubric.