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CS – 330

Comp Graphic and Visualization

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Final Project Reflection

When reflecting on this project and this course as a whole, my initial thoughts are that this was incredibly challenging but equally rewarding. I’ve never had to commit this much time to a course in any of my previous computer science courses, but seeing my completed work was worth the hours. I learned a lot about problem solving in this course by finding new ways to produce what I wanted, like creating primitives and then transforming them to build objects. Being able to reuse techniques like this to add more to my project made me feel as though I had learned some valuable skills and sharpened my problem-solving skills.

I chose the objects I did because I wanted to be able to create them by transforming shapes in different ways. The objects are made up of squares, but the squares are of all different dimensions. For example, I was able to make the speaker on the right-hand side of the scene, by starting with the same dimensions as the cube used for the box of tape. I then moved the left and right sides of the cube out along the x axis, and then scaled the back, front, and top sides along the x axis. This process allowed me to efficiently stretch the cube out by transforming simple square primitives, instead of having to create and render long rectangular pyramids.

One of the milestone requirements was to create an object out of multiple primitives, another being layering textures. I created two objects with multiple primitives; my box od tape used a cube and a plain, and my stack of books used two cubes. I was able to efficiently meet requirements with the stack of books by making one book-shaped cube and placing it on the surface of the scene, and then reusing the dimensions of the book to make a second book, and just raising it so it sat on top of the first. I then used two different textures to show the colors of each book. By using distinct textures, you can tell where one book ends and the other starts. The box of tape has a tag on top of it, I was able to make the tag using a plain which copied the same position and dimensions as the back side of the box, raised 1 unit along the z axis so that it sat on top of the box.

The camera controls of my project allow full freedom of movements around the scene for the user. The user can use the WASD keys to orbit around the scene. The Q and E keys control upward and downward movement of the scene. By holding the alt key and moving the mouse cursor, the user is able to freely turn their view, allowing them to look around the scene. The scroll wheel allows for sensitivity adjustment, and the F keys allows the user to return to the front and center of the scene.

The approach I used for generating 3D images revolves around reusability. It is possible to generate 3D images by plotting every single point and generating many different 2D shapes to create 3D objects. Instead, I built 2D planes, and then incorporated techniques to duplicate and transform these 2D shapes to create many different 3D objects of varying complexity. This technique not only allows for efficient reusability, It also makes the rendering workload for the system much lighter, making the program generate a 3D scene much quicker.