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2/21/2023

CS330 Comp Graphics and Visualization

**Reflection**

For my 3D scene I able to use two basic objects. I was able to create all objects in my scene by rendering the cube and the cylinder. After the vertices were established, I was able to pass the attributes from the vertices to the buffer and attribute objects in order to render the desired objects on the screen. For example, when rendering a cube I needed to generate the attribute and buffer objects bind them the pass them the data from the desired vertices. The Buffer and Attribute objects are then later used to generate the objects on your screen.

For the Rubik’s cube I rendered a basic three dimensional cube and bound a texture to the object using a picture I took myself of a Rubik’s cube. For the metal cylinder I rendered this object calling a custom render function defined by the Cylinder object that takes in the radius of the circle, the number of slices you wish to use to render your cylinder with, and the height of the cylinder. I also bound a black metal .jpg texture that I sourced from the web to give the cylinder a metallic and textured look. For the pencil I again rendered a cylinder passing a smaller diameter a lower number of slices and a taller height. I bound a texture to this cylinder of a pencil that I took myself. The ear buds case is actually two cylinders stacked on top of each other. I chose to use a cylinder for the object as opposed to a cube as the case is actually rounded and not a true cube. The lower cylinder I used to render the sides of the case giving it more height and binding a simple texture to the cylinder of the side of the case I took myself. The top of the case is another cylinder of the same dimensions except for the height. I made the heigh just enough to give it the look of the top of the case then bound a texture to the cylinder of the top of the case I took myself. For the plane I rendered just the bottom face of a cube. To achieve this I set the vertex attribute pointer for this objects VAO to point to the beginning vertex of the bottom face. I then bound a texture to the plane of my countertop I took myself.

To navigate around my scene a user can use the keyboard and mouse. The mouse can be used to look around in different directions as well as the scroll wheel can be used to zoom in and out, moving closer and further away from the object you are looking at. The A,W,S, D, Q and E keys can be used on the keyboard to navigate as well. The A key will pan left and the D key will pan right. The W key will zoom in wile the S key will zoom out or move away. Lastly the Q key can be used to move up while the E key can be used to move down in the environment.

Some custom functions that are used in my program are the render function used by the cylinder object that I discussed briefly previously. A new cylinder object is created with the dimensions that you provide as arguments, radius, number of slices and height. Then once your new cylinder object is created you can call the render function that will use those arguments to actually render the object on the screen. The render function will technically render three separate but connected objects. The top cover, the sides, and the bottom cover. Another custom function used by this program is the ProcessKeyboard function used by the Camera class. This function will take the key presses from the keyboard and use that value to move the camera around in the world.