7-1 Final:

Reflection

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CS 330

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2/17/21

When I originally began this project, I was going to focus primarily on one specific object. In this case, that was going to be the stove. However, as I learned more, and as we progressed through the class, I became more interested in moving this concept outward to encompass an entire room. I liked the idea of enclosing the room on all sides, except for the 4th wall, and building a basic scene of a room. This room is loosely based on this region of my kitchen, with some creative licensing, such as adding a door where there is simply a doorway.

My primary reasoning for this decision amounted to lighting. Light and texture play a crucial role in the visual quality of a graphic environment, and I was very interested in this aspect. Photography is a big hobby of mine, and lighting is something I always take interest in when taking photos. In my original image with a white stove and a highly lit room, it would likely not showcase the light and texture effects as well as an entire room could. As a result, I wanted to focus mostly on trying to create a somewhat realistic lighting atmosphere with light changing based on angle, objects having varying shines, and there being a mixture of an absence of light, and well lit areas, to create contrasting.

In order to do this, each object has its own shader program, taking the “programId” and adding a root to tie it to an object, along with its own vertex and fragment shader code, and lighting calculations. Each shader program makes use of the same overall code, but can be individually tweaked per object. For instance, my light source moves outward from a window, but the window doesn’t cast much light on the wall it is on. This is typically the case in real life as well, but it was a bit dramatic of an effect, where the left wall would be brightly lit, and the right wall would be very dark. I adjusted each wall’s lighting separately, with much of the room having low or negative ambient lighting, and turned the right wall’s ambient light up, to create a bit more of a balanced contrast. Combined with diffuse and specular, it created lighting where corners could be darker at a distance or at certain angles, and the light from the window would cast to the right wall at an angle, which were effects I quite liked.

The stove, bowl, and floor all have different levels of specular and diffuse, giving more shine to the stove and bowl, a bit less to the floor to mimic the shine of tile flooring, and much less on the roof and walls, which are more muted, with mostly diffuse and very little to no specular effect. The window has a lot of ambient light, making it appear much brighter than the rest of the room, and even washing out the texture on it. I found this effect to be pretty interesting, and realistic; if someone is standing in a darker room and looking out a window, the window has a similar effect. I spent a lot of time staring at a corner where two walls and the ceiling meet, trying to match up the shadows! I added the door into this as well, so if you stand in the farthest right corner, opposite the door, much of the shadow effect is similar across all objects.

Each object has its own individual scale and positioning, and the light source emitting form the window has a bit of a yellowish tint to it. I wanted it to appear less like artificial lighting and a bit more natural. Most objects have their own textures, with the only exception being the walls, which share a texture. As the scene makes use of a few textures, I kept the resolution lower to minimize overall file size. Objects are built and manipulated around the environment with mostly trial and error; moving a position, testing, adjusting scale, testing, etc. The stove is three parts, the primary cube shape, the top portion, and a darkened cube representing a light that indicates if an element is on. The bowl on the stove actually mimics bowls I have, being a bit of a trapezoidal prism of squares, with a smaller base and a larger top.

For navigating the scene, you can make use of WASD to move forward, backward, left, and right. Q and E are used to move down and up. The mouse pointer controls where you look. You can use the scroll wheel on the mouse to adjust FOV, effectively zooming in or out. I set the scale of textures to (1.0f, 1.0f), allowing an entire door texture or window texture to perfectly fit its object, and I have this as the global amount for all textures. With the bracket keys, you can adjust this scaling up and down in increments of 0.05f, and this will affect every texture in the scene at the same time. Holding the P key will change from projection to ortho, and releasing the key will change back. There is a bit of an issue where the world would flip upside down, so I added “gCamera.WorldUp = glm::vec3(0.0f, -1.0f, 0.0f);” to flip the scene on the Y axis, and the opposite code of +1.0f when releasing. I added a controls comment to the top of my code as well for easy reference.

I have no doubt that my code could be better optimized, but I like some portions of the code. With each addition to objects, it is pretty easy to implement each part with copy/pasting and just altering the name of the object, and adjusting individual settings from there. Much of the code is pretty well laid out, where every object’s shader program, position and size variables, etc., are with each other. The code could be trimmed down and optimized, but it is, at least, very organized and readable, and much of the code is commented with its functionality.

Overall, it has been a very interesting experience with this project. I have never done any video rendering in the past, and I don’t believe I am particularly artistic, at least in the same vein as drawing or painting, or in this case, 3D graphic design and rendering. However, once I began to get the idea and learn the ropes, I found myself lightly tweaking lighting settings, adjusting objects, trying different textures, and overall enjoying designing this scene. While my artistic skill may be minimal, it is fun to tinker, change an object, come up with something else to add; you see the humble beginnings of a basic colored square against a void build outwards to include other shapes, textures, lighting, and watch them all play a role together in building the scene.