CS-330 Final Project Design Decisions

Professor Gray

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For the final project I had selected a Tibetan singing bowl and razor that were in my office at work, because I am both culturally wise and enjoy sharp objects.

To select the shapes for the Tibetan singing bowl, I used DrawHalfSphereMesh to get the main bowl shape. I turned this into a complex shape object by adding a torus and shrinking it down for the base. This allows me to have a second shape for another texture which more accurately reflected the main image.

For the wooden handle that is used to make the singing sound, I opted for a Cylinder mesh for the thick part, a tapered cylinder mesh for the narrow part between the end and the handle, and another Cylinder mesh for the handle. I adjusted their sizes and found a rotation of x=90, y=90, z=25 to resemble the angle of the handle in the picture.

In this final milestone I also added the razor blade, which is curved in the image but is closely resembled by the Box mesh. I used 3 box meshes for the entire object; two for the blade and one for the handle.

To give the items texture qualities, I used Wikimedia Commons and found open license materials that did not require accreditation or mentioning for use. I looked for a couple of decorated metals that would work on the bowl shape, some wood textures for the desk and handle, and a blue texture with some added striations for the razor handle. Each texture was shaped to a multiple of 2 in Microsoft Paint, most of them were sufficient at 512x512 pixels.

To give the wooden Tibetan singing bowl handle some distinct visual qualities between its complex parts, I tiled the thin part with a UVScale of 2.0, 2.0 and the handle part with UVScale 3.0, 3.0. For the razor, it looked best with the texture being wrapped only once.

To navigate the scene, I made additions to ViewManager.cpp. I added up and down controls with Q and E buttons, as well as the ability to adjust speed of travel with the mouse scroll wheel, and the ability to switch between Orthographic and Perspective screens with O and P respectively.

To add lighting to the scene, I had implemented the light sources and object materials that would interact with lights. While ultimately functional, I didn’t gain a full understanding of this process. For example, I managed to get the Tibetan singing bowl to reflect a point light Index 2, but the razor blade added for this final milestone does not seem to reflect light despite my efforts. I ensured that I had a custom object material with a high shininess and relatively high diffuse, but none of my adjustments seemed to add any shine to the metal portion of the razor.

The scene lights were set up with a direction light with low ambience, medium diffuse, and 0.0f specular qualities. I added 3 additional point lights to help illuminate the scene. The last point light recently mentioned was simply to add shine to the metal, but it shined off the bowl solely instead.

Most of the 3d scene is composed in the RenderScene() method. I used a plane mesh with a wood desk texture for the main platform which gave a nice result compared to my picture. I used a Half Sphere mesh for the bowl, combined with a Torus Mesh for the bowl’s base. The handle was comprised of Cylinder and Tapered Cylinder Meshes. The razor was a combination of Box meshes.

There were minor modifications to MainCode.cpp, such as a colored background and a customized window title to reflect the project and my name. Additionally, in MainCode.cpp I ensured that the frame and z buffers were cleared.

Overall, the scene closely resembles the picture from the beginning of the term. With more knowledge and time, I could continue to create a photo-realistic scene.