EECS 672
Project 2 Report

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October 23, 2015

1   Project Inspiration

I've always been interested in the outdoors and nature, but wanted to create a scene that merged the outdoors with indoor geometry. I originally planned on creating a picnic on a grassy lawn with a blanket and related geometry, but eventually decided upon a picnic table with an umbrella.

This picnic table scene loosely mimics my family's backyard. My family frequently eats dinners outside, which has a setup very similar to my project. While not an exact replica, I've intentionally setup my scene to allow generous expansion in future projects. This could potentially include objects such as trees, bushes, and potentially the backside of the home.

2   Model Generation

My model is broken down into subclasses, and further subclasses from there. Within my project2.c++ class, I add several models such as a Floor, Table, Chairs, Glasses and an Umbrella. Each of these classes in turn use either a block, cylinder or combinations of both to create their geometries.

Each of my models have constructors that provide functionality to modify their values according to their design. For example, the Chair class accepts xMin, yMin and zMin parameters, as well as xLength, yLength, and zLength. Contrasting this model, the Glass model only accepts staring x, y and z positions, as well as a radius. For models that accept lengths, it's important to note that I've taken liberty to ensure they expand correctly. For example, if a chair is resized, the legs, base, and all back components will all resize accordingly.

3   Project Specifications

My main source of documentation was `http://people.eecs.ku.edu/~miller/`. Specifically, I found searching the class website to be particularly useful in finding relevant review material and code snippets that inspired my Project 1 design and allowed me to meet specifications. Specifically, setting up the VAO and VBO calls were initially difficult. However, I felt more comfortable after visiting office hours as well.

Since all of the specification were posted on our project assignment page, meeting requirements was not particularly difficult. Providing myself ample time was definitely advantageous in making sure I implemented certain components correctly, such as VBOs. Every time I complete one of these projects, I feel my understanding of the code grows substantially compared to my understanding gained from attending class, since actively participating in the coding process is immensely helpful to the learning process.

4   Difficulties

Rotations were definitely one of the most difficult parts of my project. Specifically, rotations within my Umbrella class caused me particular difficulty. I eventually realized that the cryph utilities offered many advantages that made my experience coding much easier, once I learned how to use them.

I agree with my classmates' sentiments that using and understanding the cryph utilities in greater detail would be extremely advantageous to completing future graphics projects. I had some initial difficulty understanding the process of manipulating matrices with these utilities.

Another one of the major issues I had was defining each objects' bounds. I had initially been simply defining their bounds from "xMin" to "xMin + lenX." While this worked for some of my objects, such as my floor, I had to get more creative with mathematics to get some of my other objects to display correctly, which in turn affected the bounds I needed to return to mcRegionOfInterest from the object.

5   Unique things

One of my goals in creating this picnic scene was to display objects that would show the lighting in a unique way. My inclusion of an umbrella that displays both the top and bottom of the object highlights the difference in lighting between the two different object sides. Ideally, I would've liked to be able to cast a shadow from the object, but unfortunately our capabilities are slightly limited in that regard.

One of the things I enjoyed was searching for RGB colors that more accurately described what the objects truly were. I've even included some of the more "colorful" names in my code.

As noted previously, for models that accept lengths, I've taken liberty to ensure they expand correctly. For example, if a Chair is resized, the legs, base, and all back components will all resize accordingly. This required significant computation and testing to ensure correct resizing.