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EECS 672 Graphics
Project 2 write up

I have always enjoyed playing with rubiks cubes, and since they seemed like an appropriately challenging focus for a beginning 3D graphics project.

I generated the model by combining smaller object to make larger and larger objects. I started with the basic block from the M&M project and then modified it to contain an arbitrary color, passed in by the constructor. Using five of these blocks, I made a table. Then I made vertical cylinders, and used them to represent the legs of a chair. Using six blocks (one for each face) I made what I called a rubiksBlock, or what a 1 dimensional rubiks cube would look like, each face mapped to the appropriate color. Also in the rubiks block you will notice that the corners and edges are empty. This is intentional so that when the rubiks cube has a face that are all the same color, each block in that face will pop out, as seen in the rubiks cube on the gold pedestal. The rubiks cube itself is a collection of 27 of these blocks.

My three ModelView subclasses (four if you count the rubiksblock) are the chairs, the tables, and the rubiks cubes. There are four instances of the chair (each oriented toward the center of the scene), three instances of the Rubiks Cube (each showing one of my three favorite rubiks patterns, they are ranked by the tables they sit on), and four tables (one large one that is the center of the scene, and three ‘pedestals’ that the rubiks cubes sit on). The piecewise linear approximation was done in the cylinder class, and can be seen on the legs of the chairs.

The cylinder was the hardest part for me. I kept dumping core and couldn’t figure out why because the looping condition on my generation for loop was i < numCircumferencePoints instead of i <= numCircumferencePoints. Also it was really slow getting started, but once I figured out how to calculate eye center and up I was able to make progress. The modeling was slow but steady, except for the aformentioned cylinder.

The most unique aspect of my project was the orientation of the rubiks blocks inside of the rubiks cubes. Since I didn’t actually rotate any of the cubes what I did to represent the rotation was change the colors of the sides of the blocks. The representation of the cube on the silver platform is actually doable with a given cube then applying the rotations: R2 L2 F2 B2 U2 D2 (in any particular order) which results in a 180 degree rotation down for every second block. The third cube (on the bronze pedestal) is my own design, what I call a center rotation, where you rotate the centers of a given cube while the rest of the blocks maintain orientation. This is preformed with the following face rotations: L’R D U’ F’B U’D. Focusing on modeling the cubes made this fun and engaging for me, so please take special notice of that aspect of my project