

Band 1 (40% - 50%)

Design

The idea for this project was to model a sushi bar. A sushi bar consists of a table, some seats, and a track where the sushi moves in a circular path to serve the customers.

Instancing

The table, seats and sushi are constructed using multiple simple shapes like a cylinder and cuboid. The basic shapes are constructed using functions in the shape.c file. In room.c, we used these functions to construct more complex shapes using these basic shapes. For example, a seat is constructed using three cylinders, one for the seat, one for the base and one for connecting the seats and base together.

Lighting and material properties

Each of the object in our scene contains a material property. We start of with a base color, for instance, a table's normal color should be a brown color to simulate wood. We use the RGB value for brown and begin tuning it until it looks appropriate in the scene. This would be our diffusive value in our material property.

Another material property we have is the metal parts of the seats. When tuning the properties, the specular values for the material should be higher as metals reflect lights much better than other materials like wood. This would reflect the color of the lights more than the color of the object.

The material struct is defined in material.h but the individual material properties are set within the draw() function for each object. The room.cpp file contains the some of the objects defined material properties.

Band 2 (50% - 60%)

User interaction

The first interaction we implemented in the scene is to use the mouse to change the viewing angle of the scene. The user would need to hold left click and drag the scene to move the camera which would manipulate the viewing angle of the scene. This was implemented using the mouse event virtual functions in Qt.

Band 3 (60% - 70%)

Element of animation

An element of animation in our scene is a rotating globe on the table of the sushi bar. Additionally, the sushi on the sushi track is also translated and rotated in the scene.

Convex object constructed from polygons

In our scene there are many convex objects constructed from polygons. For example, the table and track are convex objects constructed from polygons.

Textures

The globe uses the Mercator-projection.ppm texture file. The texture is mapped onto the sphere. The pictures for Marc and Markus were used as pictures and were placed onto the walls of the sushi bar.

Band 4 (70% - 100%)

Hierarchical modelling

In our scene, we have a lucky cat that sits on the sushi track. The right hand of the cat is constantly oscillating from a vertical position to a horizontal position. The cat sits on the track which is moving in a circular path though the scene. Despite loading the model, the creator of the model did not share a texture file hence I could not implement texture mapping for the lucky cat. Therefore, I set the color of the body and the hand in two distinct colors to make the movement more obvious.

Additional user interactions

In our scene, we have a slider that controls the speed of the track. The track can be adjusted into 9 different speeds. Additionally, we have a button that allows the user to pause the track. Pressing the button again will resume the track.