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CS6610
Opengl Assignment 3 - Documentation
Platform - Windows

The assignment creates a room with outward face of the walls culled. The floor is texture mapped with a wooden plank. A cone is drawn at the center of the room. The cone is not transparent and emits 0.3 emissive light. Also it is texture mapped with the image of earth. The image of the earth appears on the front and the back of the cone. There is a light map that can be turned on and off, which lights only a small portion of the floor. This lightmap can be moved around the floor. A sphere is drawn that reflects the surrounding environment (using cube mapping). As the camera rotates the reflection rotates along with it. If the environment is updated (cone is drawn / removed or light map is drawn/removed/moved on the floor) you can click the update cubemap button to reflect the changes in the environment. The light is in the center of the room. An emissive sphere covers it to provide an illusion of a light bulb. Also glui controls to increase or decrease the intensity of the light is provided. Also there are tori floating in the room.

Graphical User Interface

-Camera transformations could be performed with the 3 mouse buttons: right mouse button rotates, middle button zooms in and out (moves the camera on Z axis) and left button moves the camera in XY plane.
-Object transformations could be performed using the 3 controls in the top of the glui controls panel.
-Shadow types: You can select the radio button to specify the shadow type you want to implement. Option is provided to select projective, shadow map and shadow volumes or you can chose not to have shadow. In case of shadow volumes you can rotate and translate the cube occluder.
-Light: Light intensity can be controlled. Also you can move the light to any position using translation controls.
-Lightmap: Allows you to enable the lightmap and move it within the floor. The light map is restricted within the floor.
-Cubemap: Allows you to enable cube mapping and draws a reflecting sphere. The update button updates the cubemap with the changed environment Eg: cone is drawn/light map is moved etc. This will be updated onto the sphere.

Problems I had and how I solved them/still existing bug

-Had problem with the rotation of the cube occluder. And I was able to fix it by deriving shadow volumes with transformed vertices.
-Had problem with shadow mapping. Was working without textures, but does not work with it. Not able to solve!

Resources used

-I have used glew library for doing the multitexturing.

Design choices you made and why you made them

-I have created classes the Quad (walls) and Cone. This increases reusability of the code (eg: I could draw a wall just by creating an object of this class)