

2024 Fall Semester, Computer Graphics Project #4, Lighting & Shading

110 points

1. Add light sources into your scene to produce lighting effects. (You have to render the scene constructed in Homework 3.)
 2. Your scene should contain at least 3 light sources:
 - a). a directional light from the sun or other sources, b). a point light located at a fixed position in the scene (higher than any obstacle), and c) a spot light attached to your robot.
 3. Assign different material properties to object surfaces so that their appearances look like metallic, plastic, and diffuse surfaces. (60%)
 - a. Render the robot as if it is made of metallic material.
 - b. Treat the floors as diffuse surfaces (no specular).
 - c. Render buildings and some objects with glossy effects. (waxed surfaces)
 4. Shade your scene by using the smooth shading method.
 5. Complete the following functionalities too:
 - a). being able to change color/intensity of the point light source, (5%)
 - b). being able to change the direction/color/intensity of the directional light (the sun light), (5%)
 - c). being able to modify the cutoff angle, intensity and direction of the robot's light(s). (10%)
 - d). being able to turn on/off these light sources, (5%)
 - e). drawing the point and robot's lights by using spheres with emission effect. (10%)
 6. Other fancy ideas are always welcome. (15%)
- Due day: two weeks to complete this project.