CSCI 5607 Caleb Biasco – biasc007
Fall 2016 Assignment 1B Writeup

You will find all example images and their paired input files in their respective directories of the “example images” directory.

SHADOWS

As illustrated in “near shadow.ppm” and “far shadow.ppm”, the distance of the light from the objects changes how the shadows are cast.

Using directional lights instead of point lights will cause shadows to be the same size as the obstruction regardless of position. This can be seen in “directional shadow.ppm”.

A combination of lights yields can change the shape of a shadow, as “multi shadow.ppm” shows.

MATERIALS

Ambient

With no diffuse or specular coefficients, the color of an object will remain flat regardless of how many lights are in the scene. This is demonstrated in “ambient only.ppm”.

Diffuse

When we gradually increase the diffuse coefficient, we can see the roundness of the sphere as well as what lights are hitting the sphere. This progression can be seen in the “diffuse” images. There’s additional complexity in that series, too; you can only see one of the lights affecting the sphere. This is because the other light in the scene has a 0 value for red, so it doesn’t affect the sphere’s red material colors. We can see the gradual effect of the point light on the sphere in the “color” images.

Specular

We’ll lower the diffuse coefficient to emphasize this progression. The specular coefficient operates similarly to the diffuse coefficient, so the more interesting parameter is the specular exponent. When we increase it, the “falloff” of the specular highlight becomes greater, you can see circular reflections from the lights appear on the sphere as in the “specular” images.

Since the specular highlights also have their own color, I’ve also included “specular color” images to show how it affects only the specular lighting of the spheres. The diffuse color was changed to blue to illustrate how the colors of the lights affect the specular highlights regardless of the diffuse color.

OTHER

Spotlight

The effectiveness of the spotlight can be seen in the “spotlight” images. With a small θ, only the front sphere gets illuminated. As we increase θ, the cone of illumination becomes gradually bigger and lands on the other spheres, but only to the extent of θ.

We can also see the positional effect of the spotlight with “spotlight over.ppm” and “spotlight under.ppm”.

Ellipsoid

Lastly, the ellipsoid is an extra component to my program since it was a simple addition. The effects of using an ellipsoid and its lighting can be seen in “ellipsoid.ppm”.