Justin Pimentel
jfpiment@ucsc.edu
1559599
Part B

Ambient Occlusion

From what I understand, ambient occlusion is an effect that attempts to render a scene with realistic diffuse lighting relative to its location to other objects, the environment, and to the sky. It sends rays off of an exposed surface in the scene and from the data returned by those rays, it approximates how bright the surface should be based on angle and position. The word ambient signifies that it is trying to represent ambient environmental light in the world and attempting to create realistic lighting based on position without dependency on a light source. In short, it uses rays to determine the brightness of a surface based on ambient light and not based on direct light.
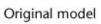
I think this could be implemented by creating an ambient light source and finding the vectors from surface points of an object to the ambient light source. Surface points with more exposure or direct contact with the ambient light source will be brighter while those with fewer contacts are colored darker. That's a massively simplified overview of how I think it would be implemented, but that's how I'd imagine it would go. I think it would be a lot of vector calculation and would be quite GPU and CPU intensive.

Ambient Occlusion Value Map:

Ambient Occlusion Side-by-Side Comparison:

Original model   With ambient occlusion   Extracted ambient occlusion map