Diffuse reflection

Simplest kind of reflection

Lambert’s law says that the resulting intensity is only proportional to the light source and the normal vector.

Perfectly specular reflection changes with the viewpoint.

* The have glossy specular highlights (secularities)
* Mirror is a perfect specular reflector

Phong Model

* A common specular reflection term is added
* Purely empirical, no physical basis

Blinn-Torrance Specular Model

To create ambient term, use a constant light source

Light is additive, so just add diffusion, specular, and ambient.

Red green and blue channels are added independently.

Red light on white object is red

Red on green object is black.

The color of the highlight is the color of the light source.

Color of a mirror is (slightly green ?)

Flat shading: fill every pixel covered by polygon with the resulting color.

Gouraud Shading: evaluate color at every vertex. Compute color for each covered pixel.

* Misses details that don’t fall on vertex.

Phong Shading: each pixel gets it’s each normal that’s interpolated from the other normal.

Summarizing the Shading Model: describe local appearance with illumination equations

Problems with Shading Algorithms

Radiosity: Heat transfer, using different lights to show the pictures of like the black board.

Diffuse shadows come from an aerial light source and reflects light off many things.

Radiosity Algorithm: break scene into small patches and assume uniform reflection and emission per patch.

Form factor: percentage of light that goes from one light to the other. It’s a ratio from 0-1