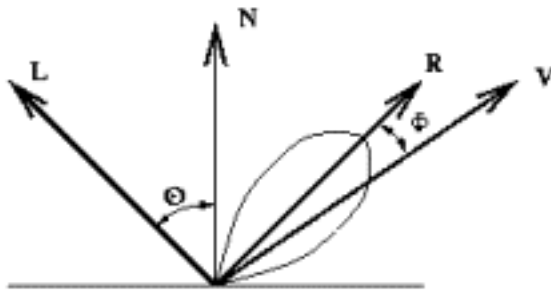


CS455

Simplified Phong Lighting Model



Distribution of Scattered Reflection

Following are equations for a simplified Phong lighting model. This lighting model gives the appearance of a plastic surface with white highlights. See page 146 in your text book for a discussion of the Phong lighting model.

$$r' = c_a r + (1 - c_a) c_s$$

$$g' = c_a g + (1 - c_a) c_s$$

$$b' = c_a b + (1 - c_a) c_s$$

where

$$R = 2(L \cdot N)N - L$$

$$c_a = a + (1 - a)L \cdot N$$

$$c_s = (R \cdot V)^n$$

In this figure, N is the surface normal, L is the unit vector to the light, R is the reflection of L , and V is the unit vector from the point to the camera. The only user-specified constants are a (the ambient light coefficient, typically about 0.2) and n (the exponent for the specular light) which is an integer. (r, g, b) is the color of the surface, and (r, g, b) is the color of the pixel. The higher the value of n the shinier the appearance of the surface because the smaller and more concentrated the highlight will appear. The strategy behind this simplified Phong lighting model is to make white highlights, and when $R = V$, the highlight will be perfectly white.