

Diffuse Reflection

CS418 Computer Graphics

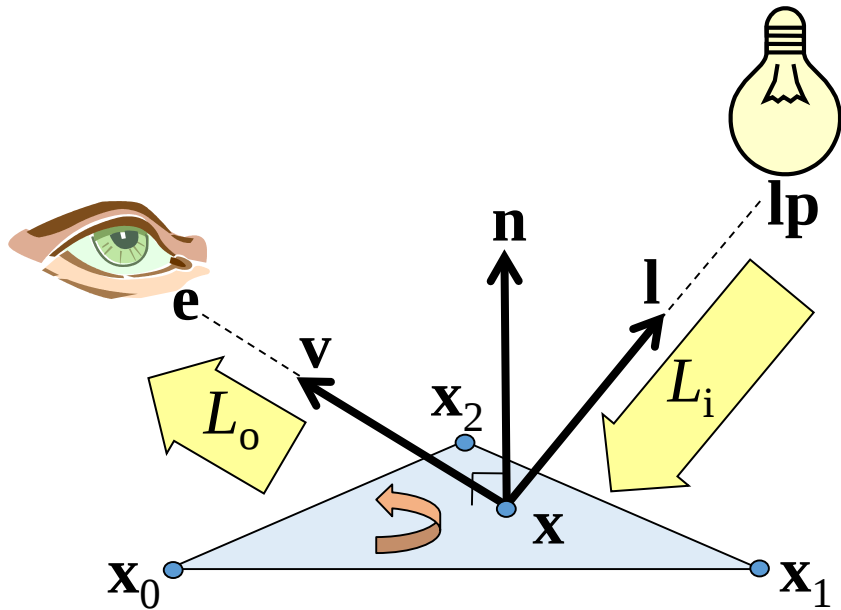
John C. Hart

Local Coordinates

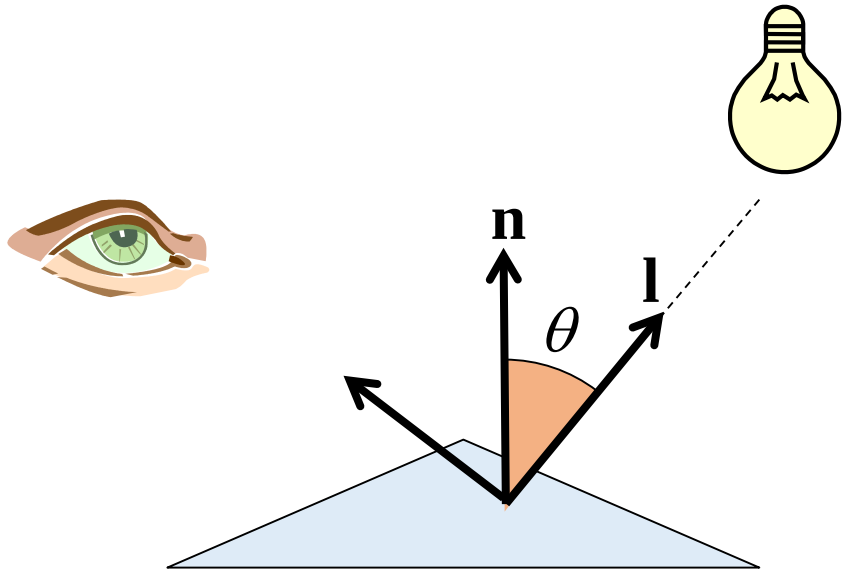
v – view vector: $\mathbf{v} = (\mathbf{e} - \mathbf{x}) / \|\mathbf{e} - \mathbf{x}\|$

l – light vector: $\mathbf{l} = (\mathbf{lp} - \mathbf{x}) / \|\mathbf{lp} - \mathbf{x}\|$

n – normal vector: $\mathbf{n} = (\mathbf{x}_1 - \mathbf{x}_0) \times (\mathbf{x}_2 - \mathbf{x}_0) / \|(\mathbf{x}_1 - \mathbf{x}_0) \times (\mathbf{x}_2 - \mathbf{x}_0)\|$



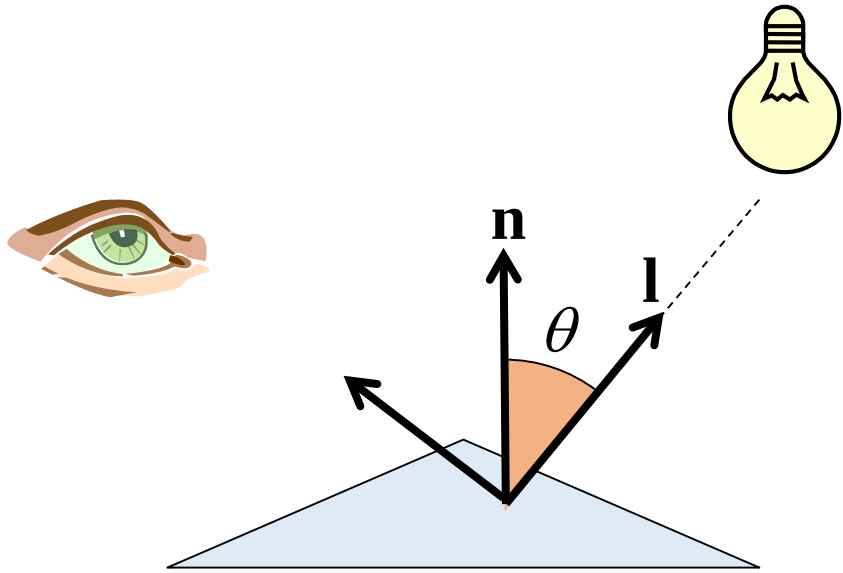
Lambertian Reflection



$$L_o = L_i k_d \cos \theta$$

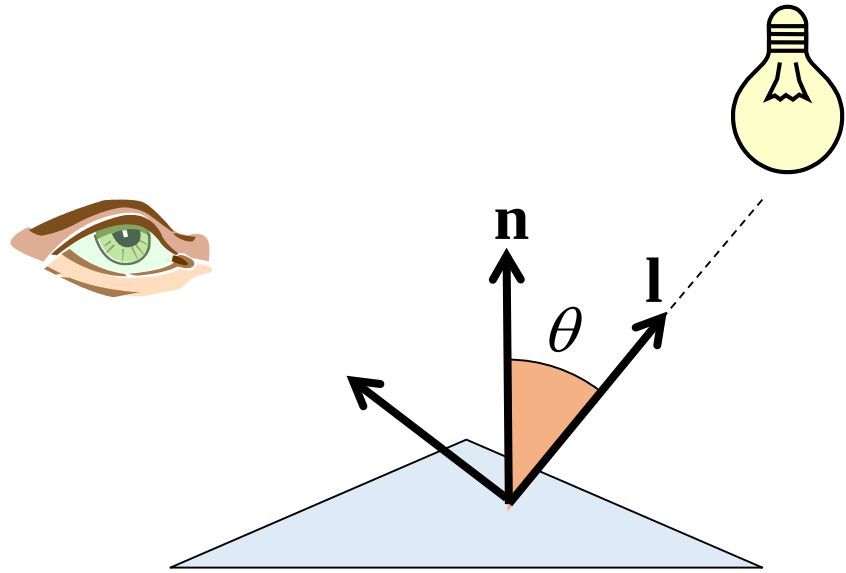
↑
% of light reflected
(rest is absorbed)

Lambertian Reflection



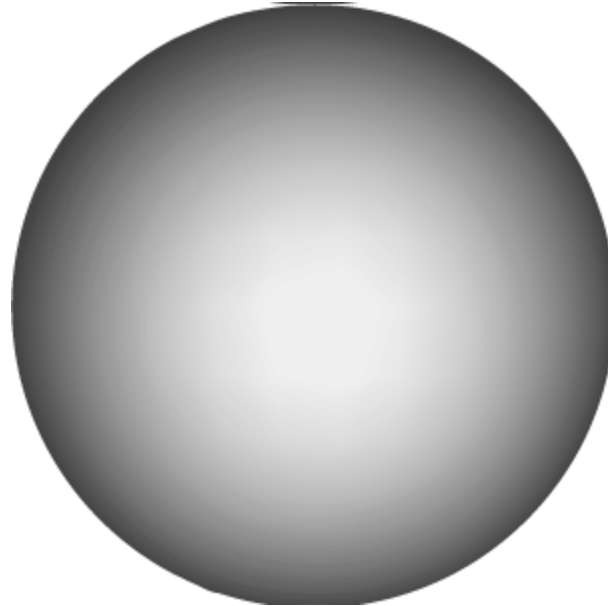
$$\begin{aligned} L_o &= L_i k_d \cos \theta \\ &= L_i k_d \mathbf{n} \cdot \mathbf{l} \end{aligned}$$

Lambertian Reflection

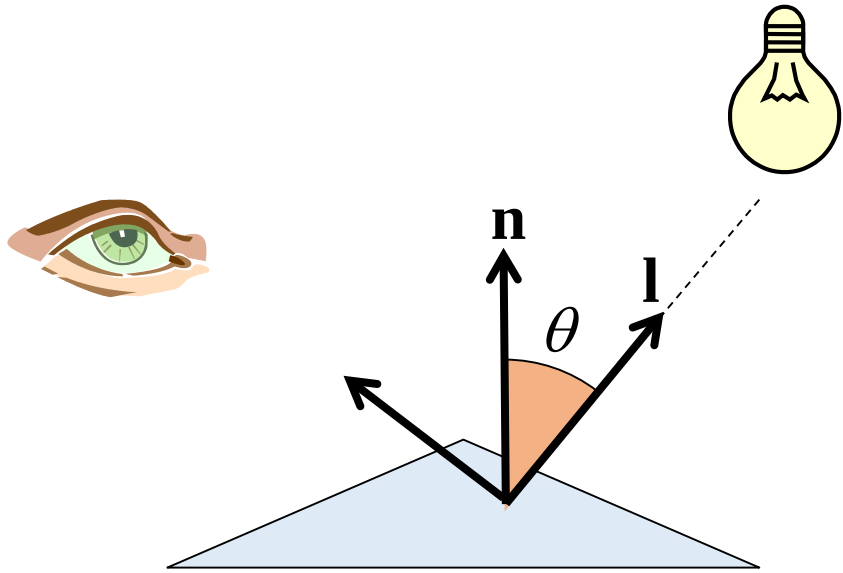


$$\begin{aligned} L_o &= L_i k_d \cos \theta \\ &= L_i k_d \mathbf{n} \cdot \mathbf{l} \end{aligned}$$

diffuse sphere with
light from viewer

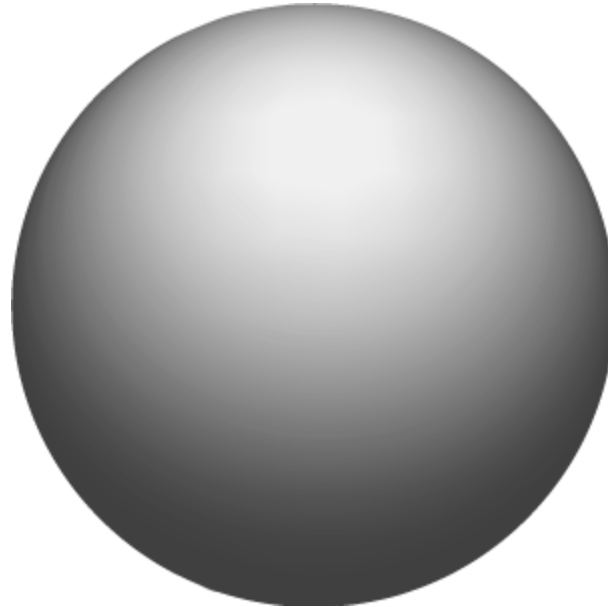


Lambertian Reflection

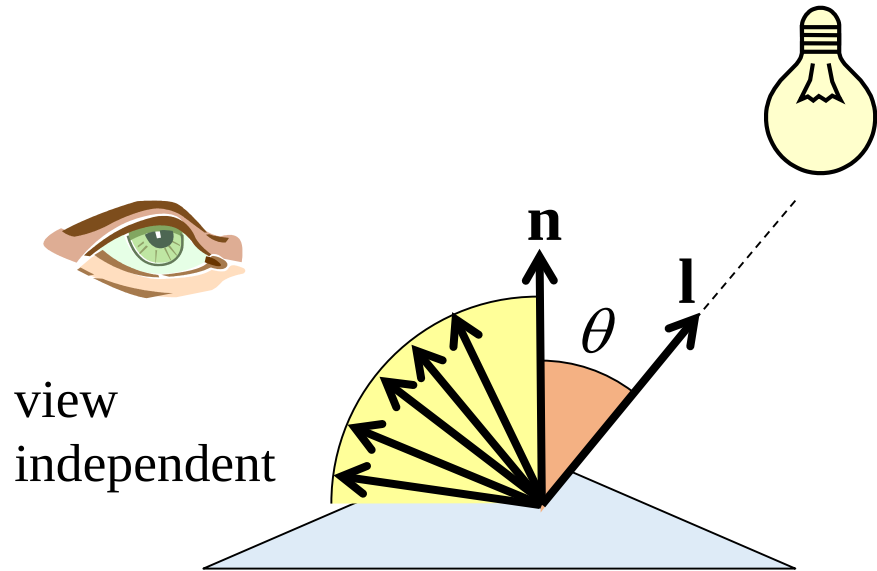


$$\begin{aligned} L_o &= L_i k_d \cos \theta \\ &= L_i k_d \mathbf{n} \cdot \mathbf{l} \end{aligned}$$

diffuse sphere with
light from above viewer



Lambertian Reflection



$$\begin{aligned} L_o &= L_i k_d \cos \theta \\ &= L_i k_d \mathbf{n} \cdot \mathbf{l} \end{aligned}$$