Shading

Feb 18

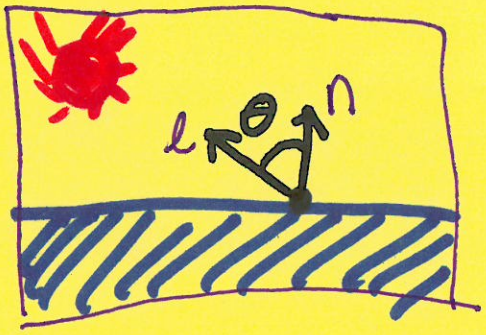
Diffuse Shading
- ex: paper, unfinished wood (not shiny)

Lambert's cos law

color ~ $\cos\theta$

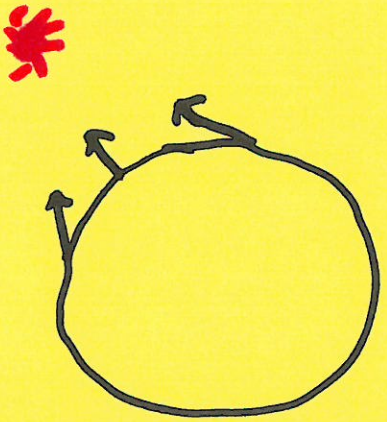
$C \sim n \cdot l$

C color for next few lectures

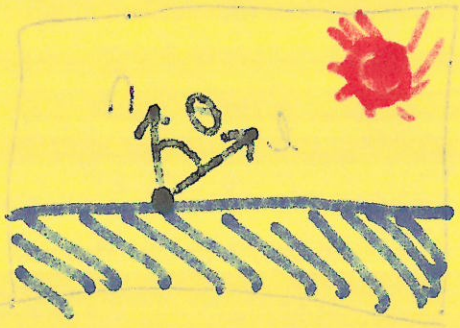


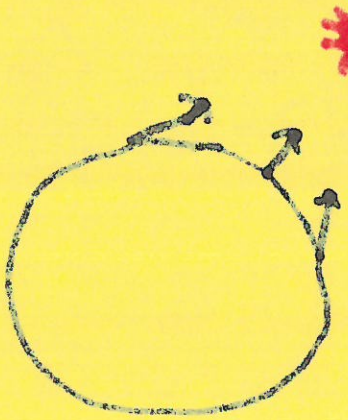
"directional light"

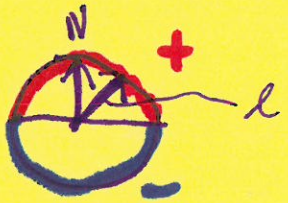
the right idea



not right idea


θ





$n \cdot l > 0 \Rightarrow$ facing light

$n \cdot l < 0 \Rightarrow$ not facing light

Diffure reflectence

$c_r \in [0, 1]$

$C \sim c_r * n \cdot l$

normal at some point on surface

direction of the light saree

material property

add light intensity $c_l \in [0, 1]$

$C = c_r c_l \, n \cdot l$

"Real" "diffuse" reflectance

$$C = C_r \circledast C_l * \max(0, n \cdot l)$$

$$= \begin{bmatrix} C_r.red \\ C_r.green \\ C_r.blue \end{bmatrix} \circledast \begin{bmatrix} C_l.red \\ C_l.green \\ C_l.blue \end{bmatrix} * \max(0, n \cdot l)$$

$$= \begin{bmatrix} C_r.red * C_l.red \\ C_r.gre * C_l.green \\ C_r.blue * C_l.blue \end{bmatrix} * \max(0, n \cdot l)$$

Add ambient lighting

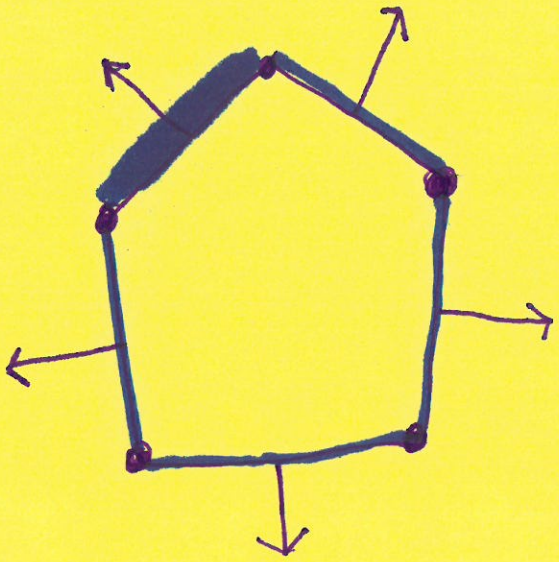
Let C_a be ambient term

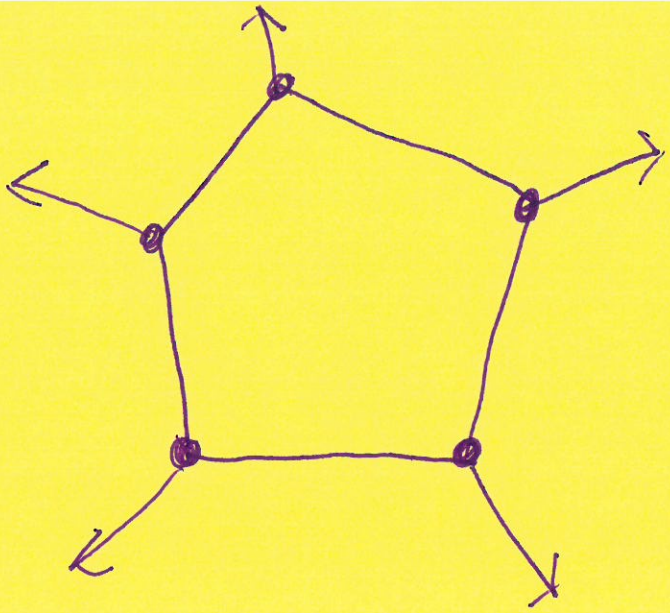
$$C = C_r(C_a + C_e \max(0, n \cdot l))$$

Problem C may be greater than 1

1) C clamp between $[0, 1]$

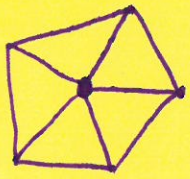
2) $C_a + C_e \leq (1, 1, 1)$





How do I get normals?

1) model comes w/ one

2)  (heuristic) average of normals of Δs in fan around vertex

3) if model is Δtion of smooth surface
compute from the surface