CSC 240
Computer Graphics

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Fall 2016
Smith College
Outline: 11/21

- Hidden Surface Removal
- Rendering pipeline and introduction to ray tracing
- Blender Lab: chair and wine glass
- Blender Online Textbook on the website

- **HW 8**: due tomorrow (Tues)
- **Office Hours**: Mon/Tues 4-5pm
- **TA Hours**: I will be there 7:30-9:30pm tonight
- **Thanksgiving**: I am away Wed-Fri
Hidden Surface Removal
A simple three-dimensional scene

Z-buffer representation
Introduction to Ray Tracing
Turner Whitted, 1980

An improved illumination model for shaded display,
Communications of the ACM, v.23 n.6, p.343-349, June 1980
Cornell Box
Ray-tracing: useful for complicated light models
Eye (camera), viewport, world
“Wasted” rays don’t hit the eye
Instead: start from the eye, not the light

Credit: Paul Rademacher
Bidirectional path tracing
Ray Casting

∀ pixel
create a ray from eye
∀ object in world
calculate intersection with ray
keep if closest
∀ pixel
create a ray from eye
∀ object in world
calculate intersection with ray
keep if closest
Color pixel based on material & angle of surface to light
Shading/Coloring

Color pixel based on material & angle of surface to light
Ray Tracing

- Secondary rays (shadows, reflection)
Ray Representation