Introduction

CIS782
Advanced Computer Graphics
Based on notes of Raghu Machiraju and Torsten Moeller
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Realism Through Synthesis
Holy Grail

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Photorealistic (Physically Based) Rendering

- Visibility: sampling
  - camera to surface
  - surface to surface
  - surface to light source

- Optics
  - Nature of Light & its Transport
  - Interaction with surface

- Display: sampling & color mapping
  - Perception-based
Graphics Pipeline

Modeling → Transform → Visibility

Illumination + Shading

Perception, Interaction

Color

Texture/Realism
Integrated Text & Software

- "Physically Based Rendering" by Pharr & Humphreys

- PBRT software from book / web site

- www.pbrt.org

- Software on your own machine?
  * if not, let me know asap
Grading

• Labs - 40%
• Homework - 5%
• Midterm - 20%
• Final Project - 35%
• Final?
Required Background

• Good Programming Background - C/C++

• Basic computer graphics (681 or equivalent)
  – ray tracing

• Basic Linear Algebra - Matrices, Vectors

• Basic Computer Science - Data Structures, Grammars

• Basic applied math - interpolation, approximation theory
Performance expected:

- Keeping up with the text(s) is VERY important
- Reading necessary foundational material
- Respond to somewhat open-ended assignments
- Be motivated to learn the material
I am not going to ...

• Teach C/C++

• Teach Data Structures

• Teach Linear Algebra

• Teach PBRT implementation

• Hold your hand
Do immediately!

• Get **PBRT** up and running on your, or some other, computer

• Do **Lab 0**: render an image using PBRT with one of the supplied input files.

• Read the book about ‘**literate programming**’
  – this will not be covered in class!

• Start getting familiar with **PBRT software structure**
  – We’ll devote some class time to this