



---

# COMP 600.456: Rendering Techniques

**Jonathan Cohen**

---

Johns Hopkins Department of Computer Science  
Course 600.456: Rendering Techniques, Professor: Jonathan Cohen



# Preliminaries

---

- 1. Fill out roster**
- 2. Go over syllabus**
- 3. Answer questions**
- 4. Students tell all (names, etc.)**



# Overview of Topics

---

**3D Rendering in general**

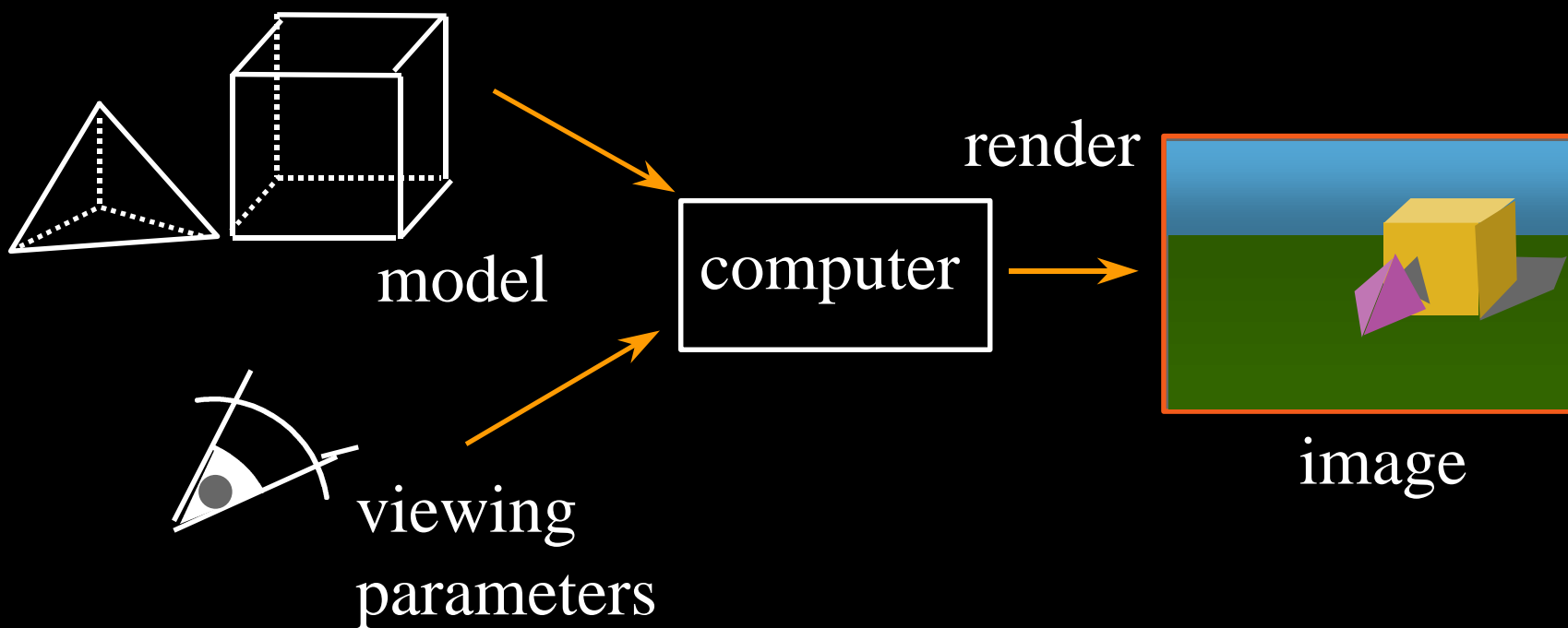
**Surface rendering**

**Volume rendering**

**Image-based rendering**



# 3D Rendering





# Types of 3D models

---

## Surface (boundary representation)

- Polygonal
- Curved surface (implicit or parametric)

## Volume (solid representation)

- Voxels
- Constructive solid geometry (CSG)

*Type of model influences type of rendering algorithm*

---



# Surfaces - order of traversal

---

**First by object, then by pixel (picture element)**

- **Scan conversion**

**First by pixel, then by object**

- **Ray casting/tracing**



# Volumes - order of traversal

---

**First by volume element, then by pixel**

- **Splatting**

**First by pixel, then by voxel**

- **Ray tracing**



# Image-based

---

**First by image sample, then by pixel**

- **3D image warping**

**First by pixel, then by image sample**

- **Light field rendering**