CS130
Computer Graphics

Tamar Shinar
Computer Science & Engineering
UC Riverside
Welcome to CS130!

Talton et al., 2011

Schröder, 2000

LLNL

Hong et al. 2007

Henrik Wann Jensen

ILM

Pixar
Today’s agenda

• Course logistics
• Introduction: graphics areas and applications
• Course schedule
• Math review
Course Overview

- Learn fundamental 3D graphics concepts
- Implement graphics algorithms
  - make the concepts concrete
  - expand your abilities and confidence for future work
Course Logistics

• Professor: Tamar Shinar
• TAs: Jason Goulding, Kristian Tram
• Website: http://www.cs.ucr.edu/~shinar/courses/cs130
• Lectures: MWF 1:00pm-1:50pm
• Lab: M 6, Th 11am, 2pm
• Announcements made in class and through ilearn
• Questions and discussions: Piazza
Course Logistics

- Grading
  - 20% labs (8-10)
  - 15% project checkpoints
  - 30% projects (2 projects, 15% each)
  - 35% tests (1 midterm 15%, 1 final 20%)
- Detailed schedule on class website
Textbook

Fundamentals of Computer Graphics
Shirley and Marschner
(3rd or 4th edition)

Additional books
Introduction
Graphics applications

- 2D drawing
- Drafting, CAD
- Geometric modeling
- Special effects
- Animation
- Virtual Reality

- Games
- Educational tools
- Surgical simulation
- Scientific and information visualization
- Fine art
• **Modeling** - mathematical *representations* of physical objects and phenomena

• **Rendering** - creating a *shaded image* from 3D models

• **Animation** - creating motion through a sequence of images

• **Simulation** - physics-based algorithms for animating dynamic environments
Modeling

Talton et al., 2011

Wang and Solomon, 2019

Igarashi et al., 2007

CFD Technologies

Bronstein et al., 2011

Schröder, 2000
Rendering

Hong et al. 2007

d’Eon and Irving, 2011

Henrik Wann Jensen
Animation

Sleeping Beauty, Disney, 1959

Monsters Inc, Pixar, 2001

Life of Pi, 2012

Adventures of Tintin, Weta 2011
Simulation

ILM

Pixar

Weta
fluid simulation in Pixar’s *Ratatouille* 2007
Other areas...

- Interactivity (HCI)
- Image processing
- Visualization
- Computational photography
Math Review
<whiteboard>