CS130
Computer Graphics

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

Talton et al., 2011

Schröder, 2000

LLNL

ILM

Hong et al. 2007

Pixar

Henrik Wann Jensen
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: Tanmay Shah, Jason Goulding
• Website: http://www.cs.ucr.edu/~shinar/courses/cs130
• Lectures: MWF 1:40pm-2:30pm, UV8
• Lab: M 6:10 PM - 9:00 PM, WCH 133; Tu 8:10 AM - 11:00 AM, WCH 132; Tu 2:10 PM - 5:00 PM, WCH 132; Tu 11:10 AM - 2:00 PM, WCH 133
• 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
About the professor

- B.S., University of Illinois in Urbana-Champaign, Mathematics, Computer Science, Fine Art
- Ph.D., 2008, Stanford University on simulation methods for computer graphics
- NYU postdoc on computational biology
- Joined UCR CS&E department in the Fall 2011
- Work in graphics simulation and biological simulation

http://www.cs.ucr.edu/~shinar
About the TAs

• Tanmay Shah
• Jason Goulding
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
Graphics areas

• **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

Igarashi et al., 2007

CFD Technologies

Bronstein et al., 2011

Schröder, 2000

Figure 1: Teddy in use on a display-integrated tablet.
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
Firestorm
Harry Potter and the Half Blood Prince
Industrial Light + Magic
fluid simulation in Pixar’s Ratatouille 2007
Other areas...

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