CS230 : Computer Graphics
Winter 2016

Tamar Shinar
Computer Science & Engineering
UC Riverside
Welcome to CS230!

Talton et al., 2011

LLNL

Schröder, 2000

Henrik Wann Jensen

Hong et al. 2007

ILM

Pixar
Today’s agenda

- Course Logistics
- Introduction: graphics areas and applications
- Course schedule
- Introduction to OpenGL
- 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

- Instructor: Tamar Shinar
- Website: http://www.cs.ucr.edu/~shinar/courses/cs230
- Lectures: MWF, 9:10-10am
- Office hours: TBD, WCH 419
Course Logistics

• Grading
  • 15% quizzes and exercises
  • 50% assignments (2 assignments, each ~2-3 weeks)
  • 35% final project
  • No exams
• Total of 2 late days (48 hours) for the quarter for the assignments only
• final project must be submitted on time
• assignments individual; project individual or group of 2
Textbook

Fundamentals of Computer Graphics
Shirley and Marschner

Additional books
About me

• B.S., University of Illinois in Urbana-Champaign, Mathematics, Computer Science, Fine Art

• Ph.D., 2008, Stanford University on simulation methods for computer graphics

• Started at UCR in the Fall 2011

• Work in graphics simulation and biological simulation

    http://www.cs.ucr.edu/~shinar
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 models for modeling dynamic environments

Which area would you like your final project to be in?
Modeling

Talton et al., 2011

Igarashi et al., 2007

CFD Technologies

Bronstein et al., 2011

Schröder, 2000

Figure1: Teddy in use on a display-integrated tablet.
Animation

- Sleeping Beauty, Disney, 1959
- Monsters Inc, Pixar, 2001
- Life of Pi, 2012
- Adventures of Tintin, Weta 2011
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Simulation
Firestorm
Harry Potter and the Half Blood Prince
Industrial Light + Magic
Firestorm
Harry Potter and the Half Blood Prince
Industrial Light + Magic
fluid simulation in Pixar’s *Ratatouille*
fluid simulation in Pixar’s Ratatouille
Other areas...

- Interactivity (HCI)
- Image processing
- Visualization
- Computational photography