CS 294-13
Advanced Computer Graphics

Introduction and Administrivia

James F. O’Brien
Associate Professor
U.C. Berkeley

Instructors

• Prof. James O’Brien
  • Geometric modeling
  • Surface reconstruction
  • Simulation of physical systems
  • Motion capture
  • Computer animation

• Prof. Ravi Ramamoorthi
  • Other things that are also quite interesting

See webpages for office hours and contact info.
# Topics

- Introduction to Basic Ray Tracing and BRDFs
- Global Illumination and Monte Carlo Rendering
- Recent Developments in Fast Offline Rendering
- Image-Based and Real-Time Rendering
- Data-Driven Methods
- Signal-processing and low-dimensional and data-sparse methods
- Imaging and Computational Photography
- Basic Geometric Concepts
- Meshes and Subdivision Surfaces
- Finite Elements and Numerical Integration for Animation
- Fluid Simulation and Reduced Order Models
- Inverse Kinematics
- Rigid Body Dynamics

# Lectures

- Lectures covering course topics
  - We'll attempt to post notes/slides beforehand
  - Designated scribe for each lecture

- Interactivity is important
  - It makes the class a lot more fun/interesting
  - If you don't ask questions and comment, you might as well get an online degree
  - If we get bored we might amuse ourselves by giving you quizzes
### Class Website

- Webpage with description of class is at
  
  \[www-inst.cs.berkeley.edu/~cs294-13\]

- Handouts, notes, slides, etc. will be posted there

- Class roster

### Mailing List

- Mailing list used for group discussion
  
  \[cs294-obrien@lists.eecs.berkeley.edu\]

- To sign up
  
  - Send message to \[sympa@lists.eecs.berkeley.edu\]
  
  - For the subject line enter \[subscribe NameOfTheList\]
  
  - Leave body empty
  
  - \[NameOfTheList\] should be "cs294-obrien" (without the quotes)
  
  - Send the message from your desired receiving account
  
  - Look for confirmation message

- You must sign up or else you’ll not be signed up
Roster Page

- Send email to cs294-13@mail.eecs.berkeley.edu
  - Subject is "Roster page setup"
  - Body contains exactly the following lines
    - Your Name
    - Grad/undergrad in what department
    - Your email address
    - URL for your home page
    - URL for a picture of you (200 w x 300 h)
    - A blurb about you up to 5 lines long
  - This will be processed by a script. Please follow instructions exactly.
- This is not optional

Assignments

- Four assignments
  - Assignment 1: Monte Carlo rendering
  - Assignment 2: Real-Time or Image-Based rendering
  - Assignment 3&4: Prof. Ramamoorthi is more organized than Prof. O'Brien
- Done individually or in groups of two
- Ask about substituting a research project for one or two of the assignments
<table>
<thead>
<tr>
<th>My Research Interests</th>
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<tbody>
<tr>
<td>Motion Capture</td>
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![Motion Capture Image](image1)

![Real Time Screen Capture](image2)
My Research Interests

Explosions

My Research Interests

Fluid Simulation and Surface Tracking
My Research Interests

Viscoelastic Fluids
(aka Goop)

My Research Interests

Fracture
### My Research Interests

<table>
<thead>
<tr>
<th>Things with No Clear Utility</th>
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<td><img src="image1.png" alt="Diagram" /></td>
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### My Research Interests

<table>
<thead>
<tr>
<th>Video Games</th>
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| **Simulated Materials**  
(Recorded on Xbox 360) |

![Image](image2.png)
<table>
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<tr>
<td>Surgical Simulation</td>
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![Surgical Simulation Image](image-url)
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<tr>
<td>See webpage for more stuff...</td>
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