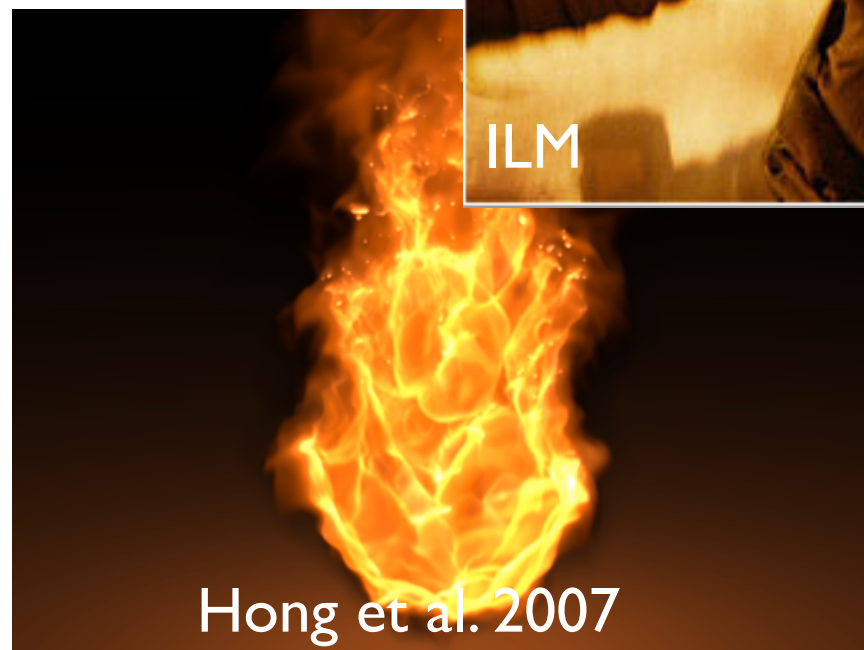
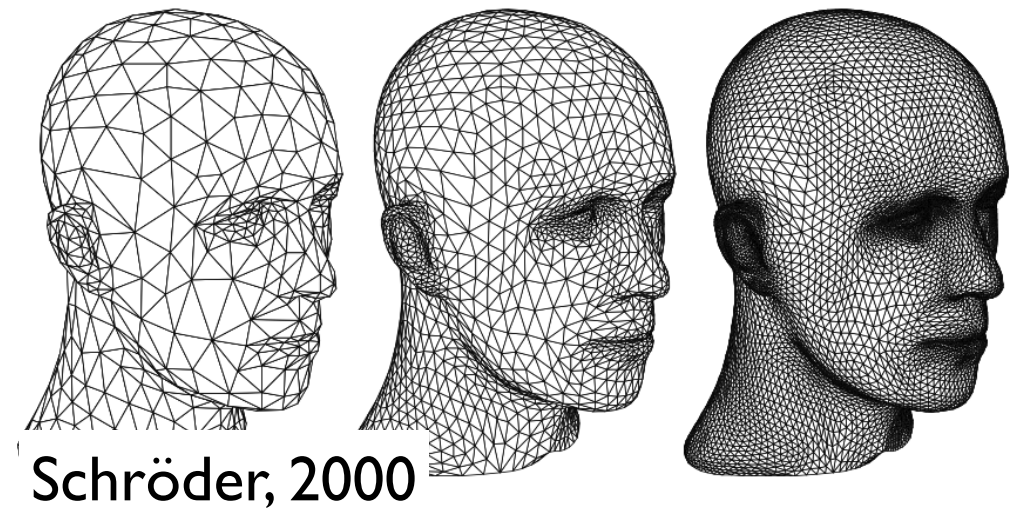
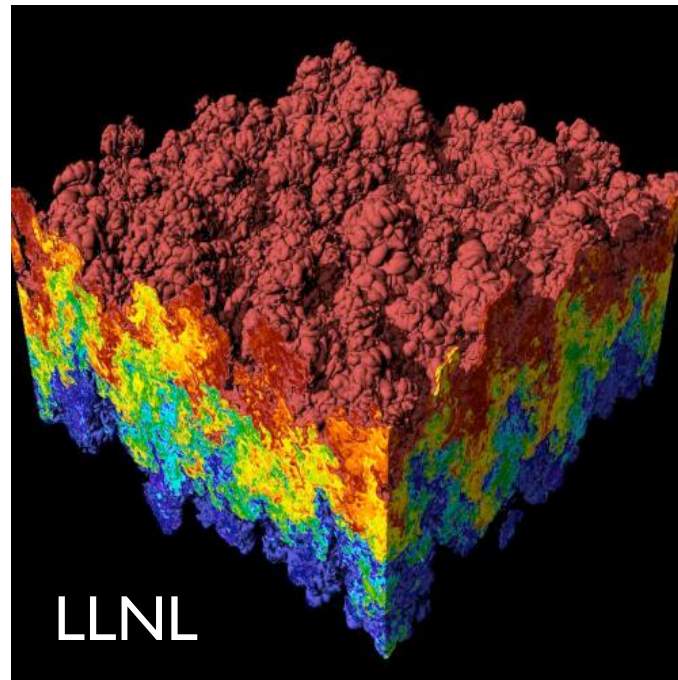


CS130

Computer Graphics

Tamar Shinar
Computer Science & Engineering
UC Riverside

Welcome to CSI 30!



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

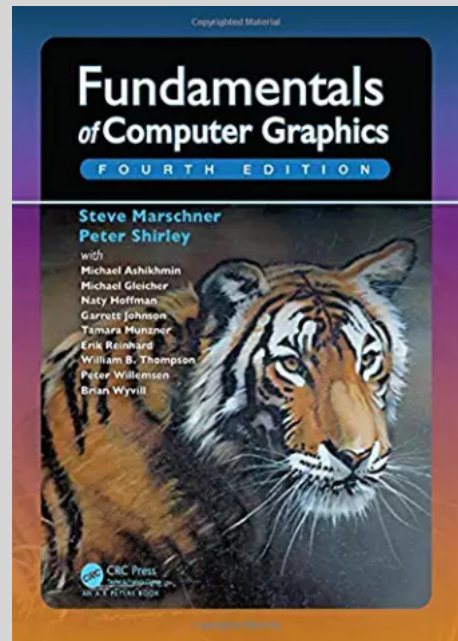
Course Logistics

- 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

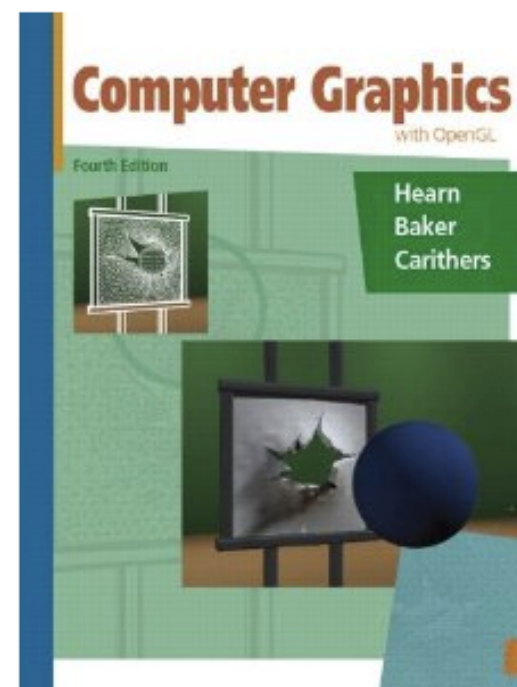
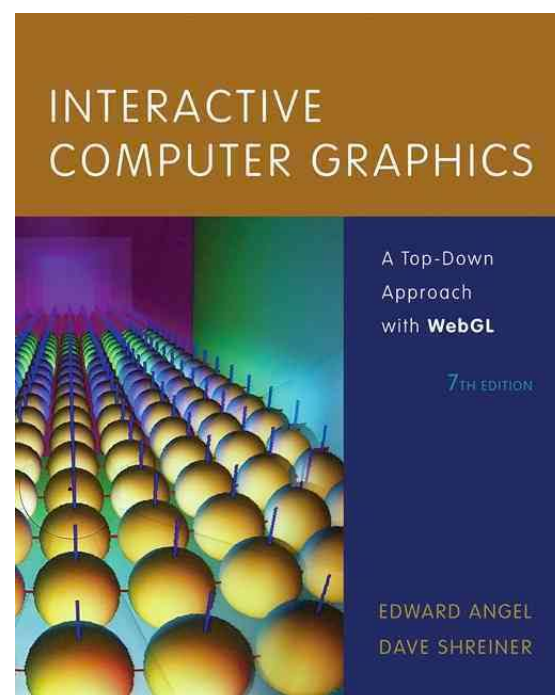
- Grading
 - 20% labs (8-10)
 - 15% project checkpoints
 - 30% projects (2 projects, 15% each)
 - 35% tests (1 midterm 15%, 1 final 20%)
- Detailed schedule on class website

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

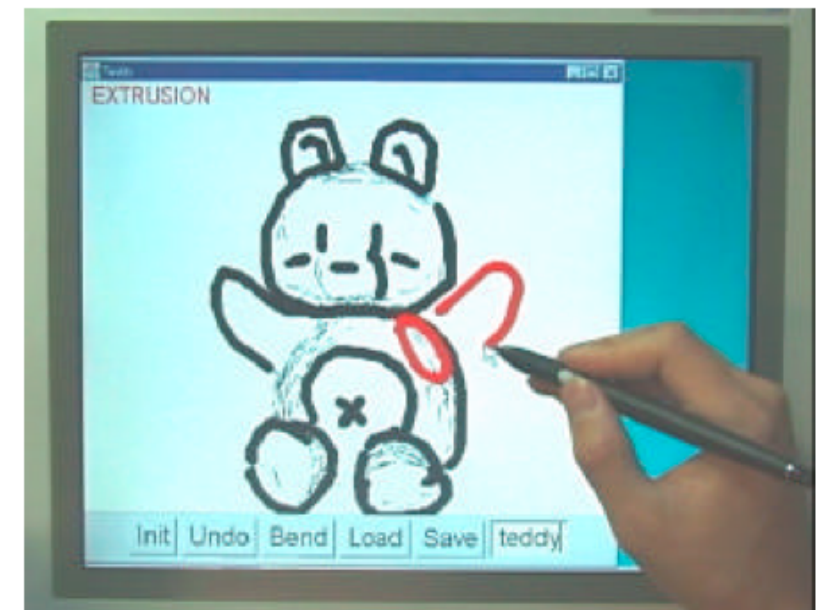
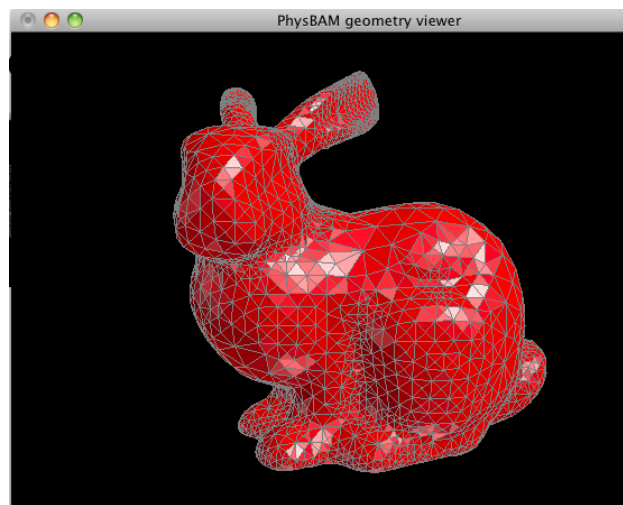
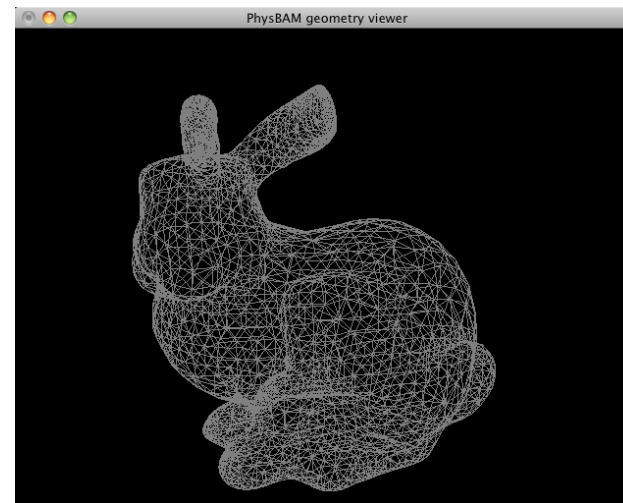
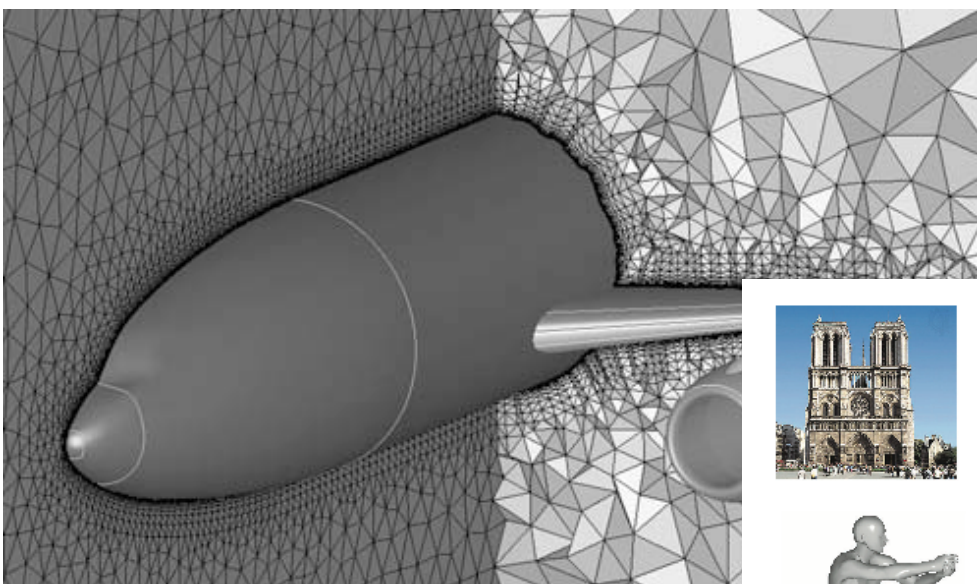


Figure1: Teddy in use on a display-integrated tablet.



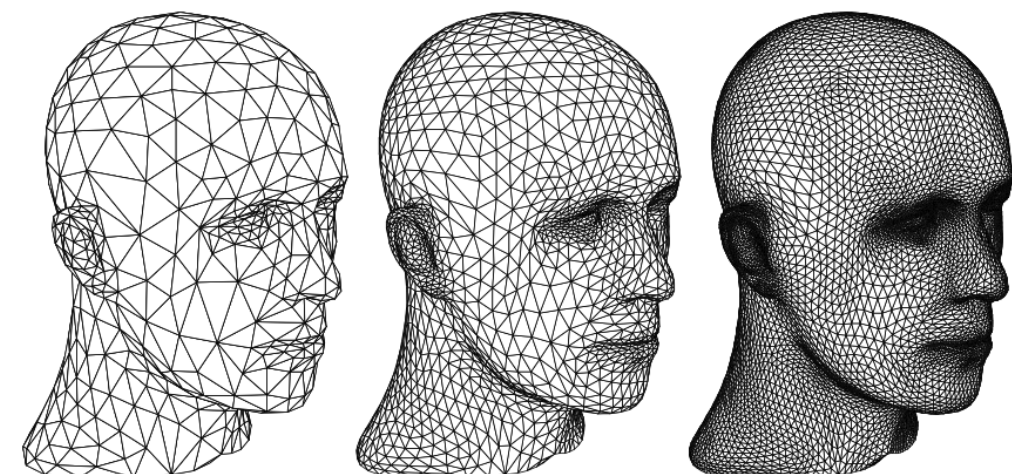
Igarashi et al., 2007



CFD Technologies

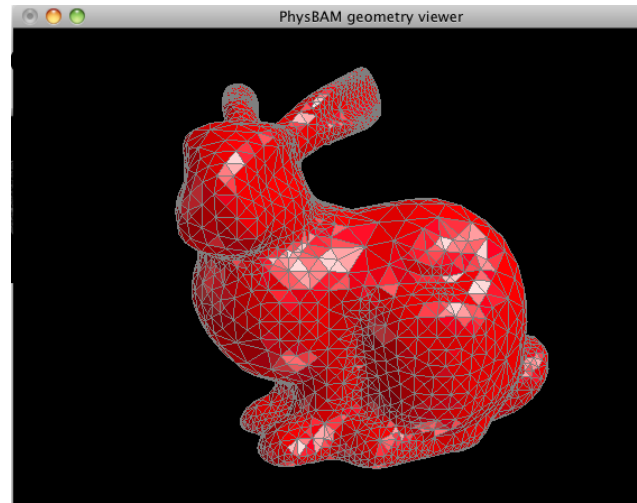
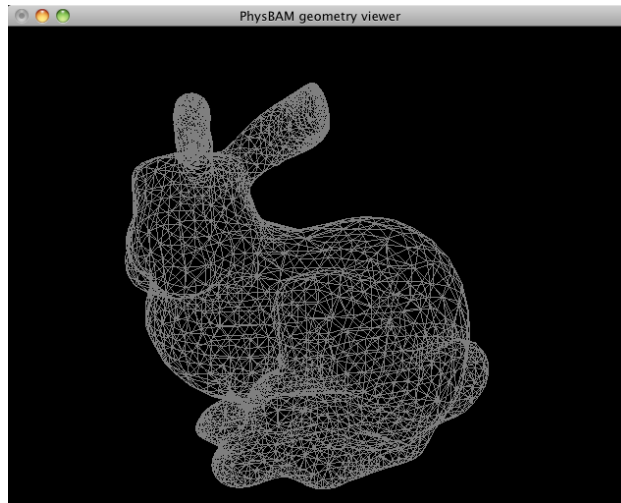


Bronstein et al., 2011



Schröder, 2000

Rendering



Hong et al. 2007



Henrik Wann Jensen



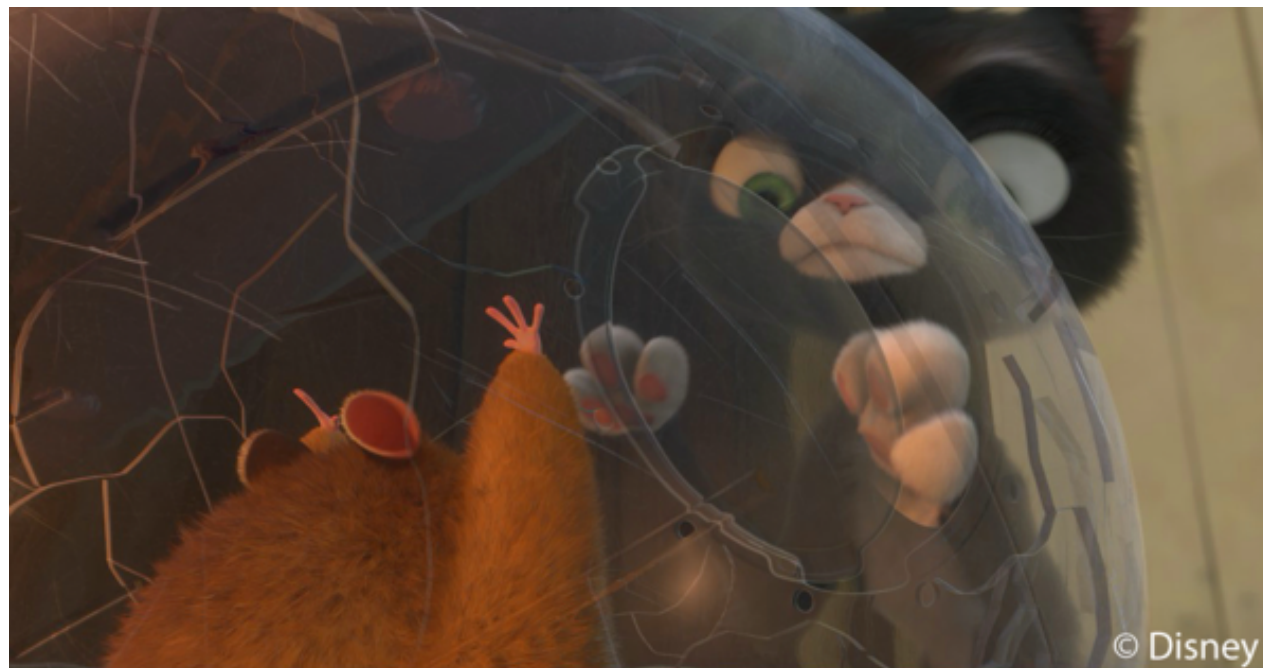
d'Eon and Irving, 2011



Animation



Simulation





Firestorm

Harry Potter and the Half Blood Prince

Industrial Light + Magic

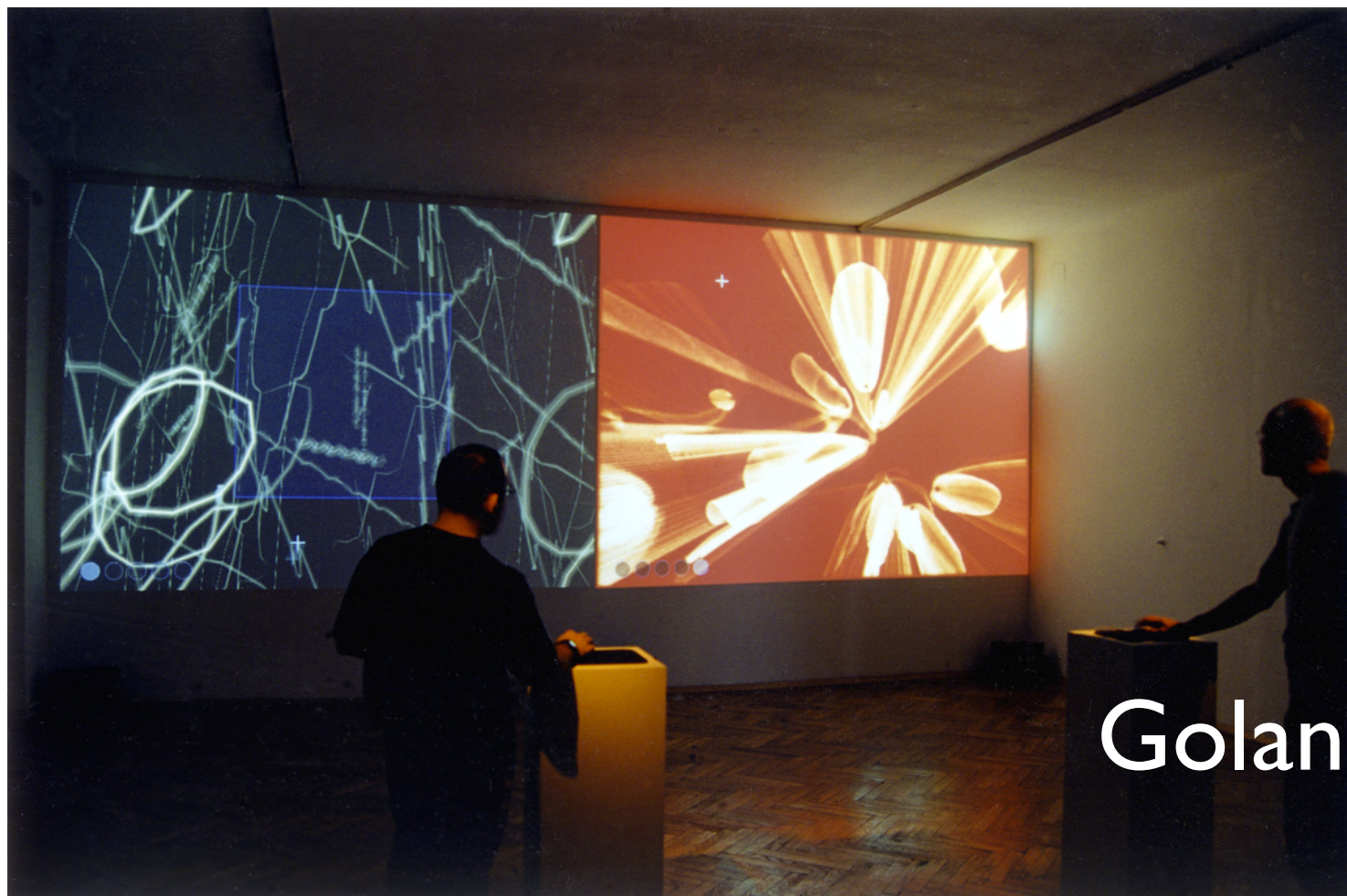


fluid simulation in Pixar's *Ratatouille* 2007

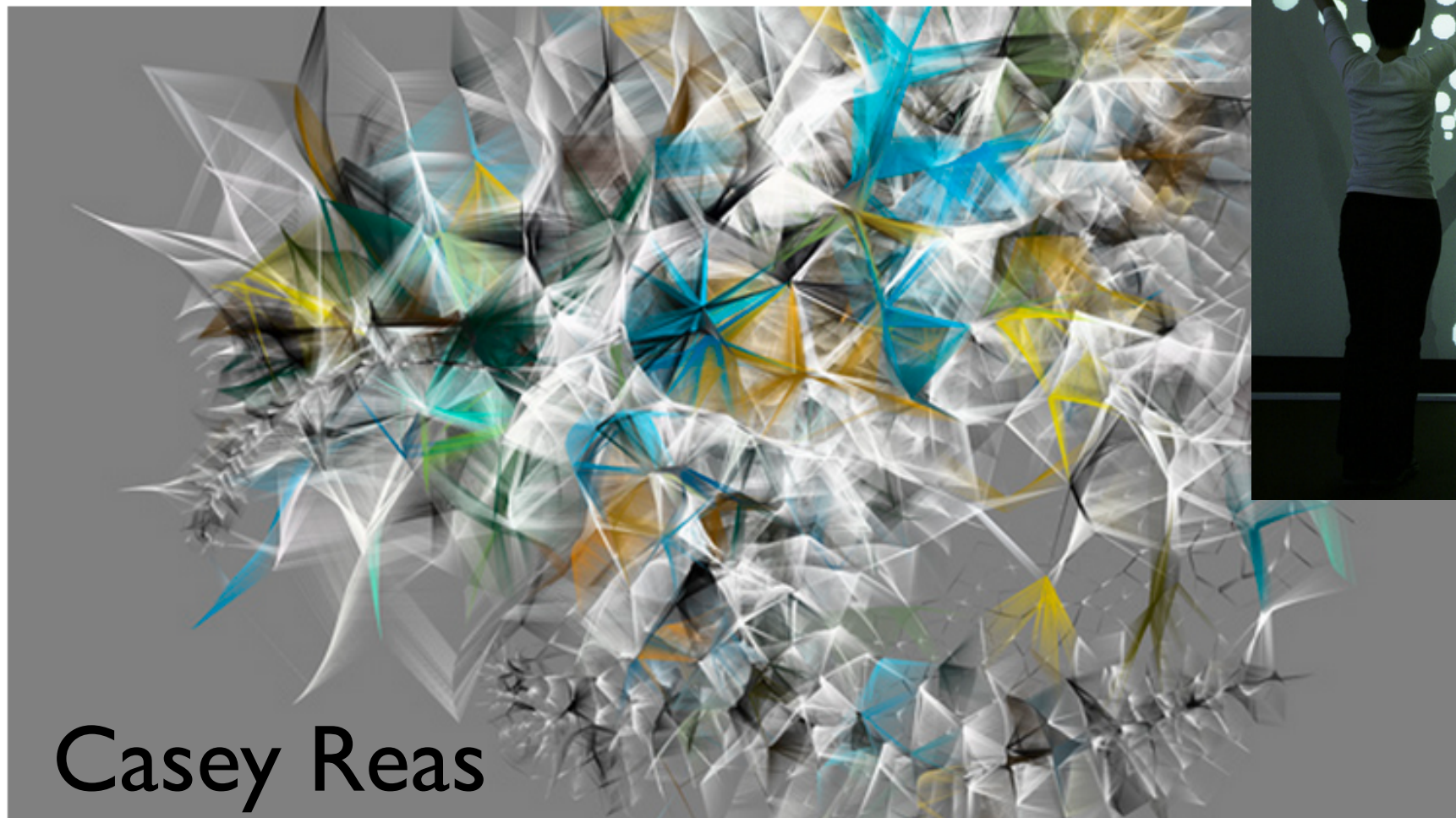


©Disney

Stomakhin et al. 2013



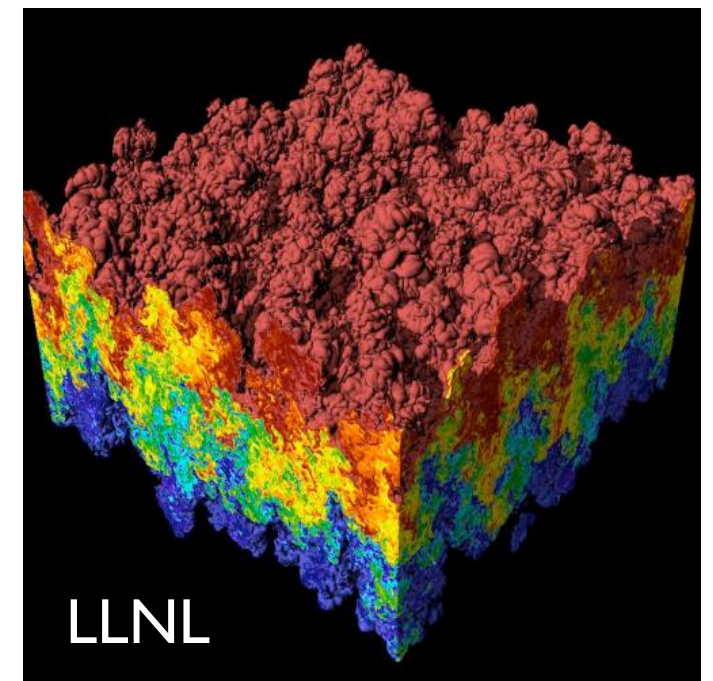
Golan Levin



Casey Reas

Other areas...

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



Math Review

<whiteboard>