CS230 : Computer Graphics
Winter 2016

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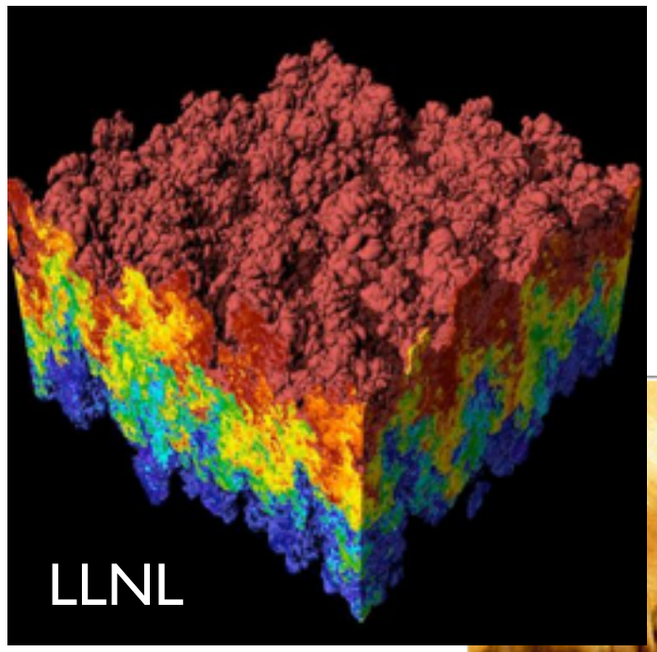
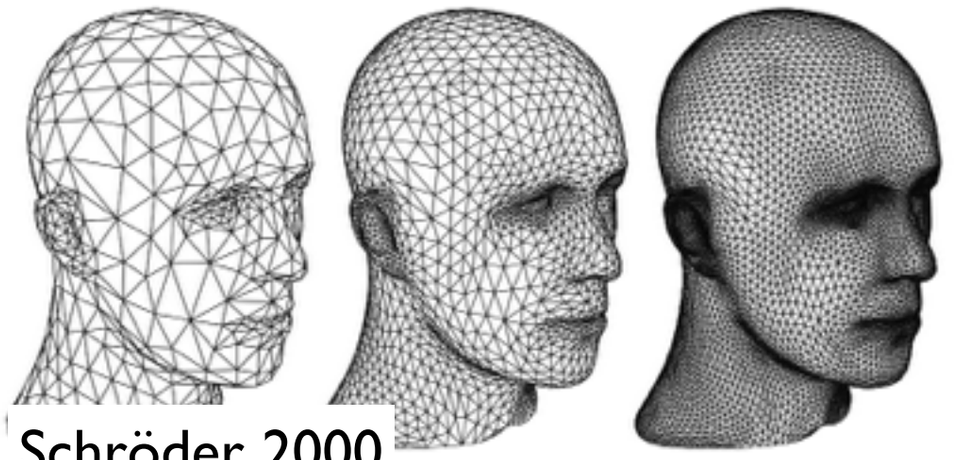
Computer Science & Engineering
UC Riverside

Welcome to CS230!

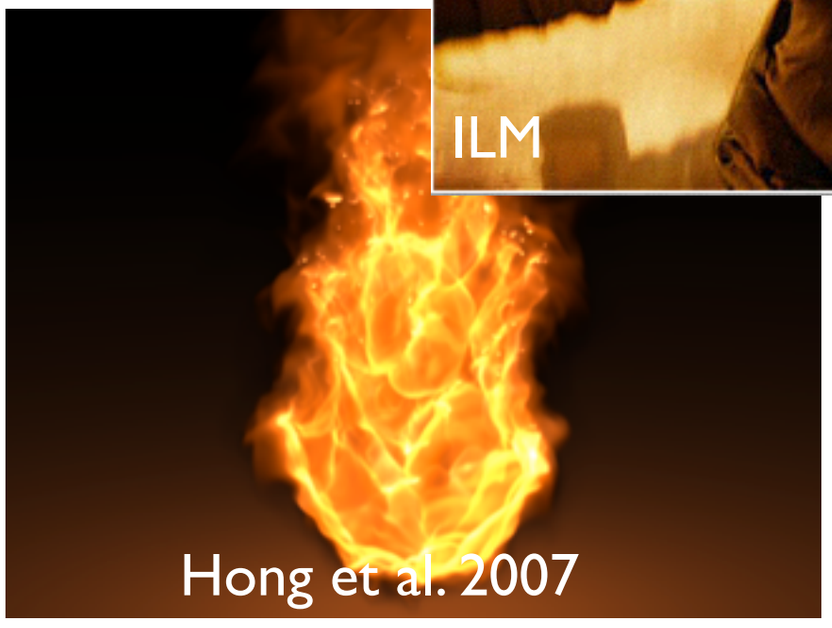

Talton et al., 2011

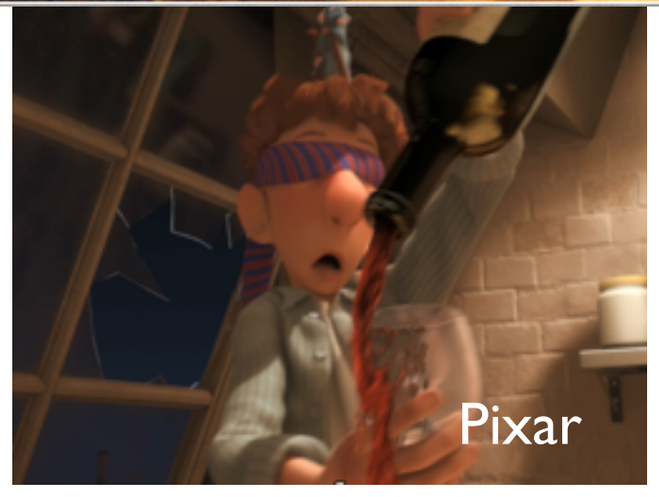

LLNL


Schröder, 2000


ILM


Henrik Wann Jensen


Hong et al. 2007


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

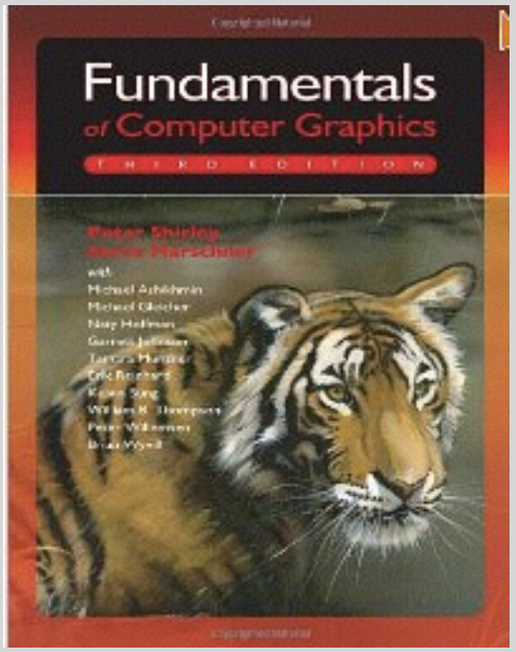
Course Logistics

- 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

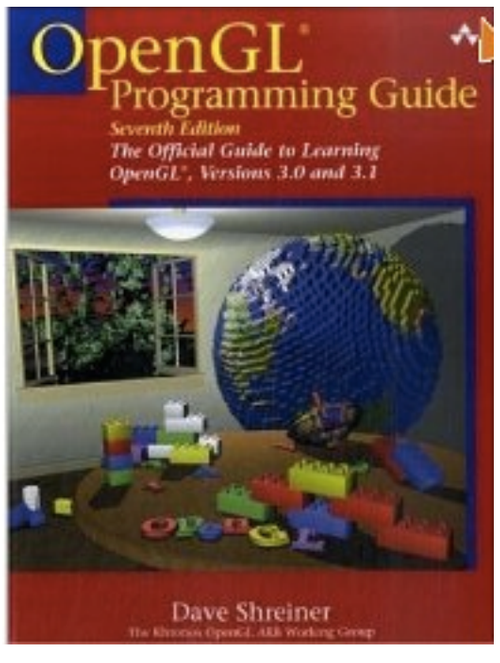
Textbook

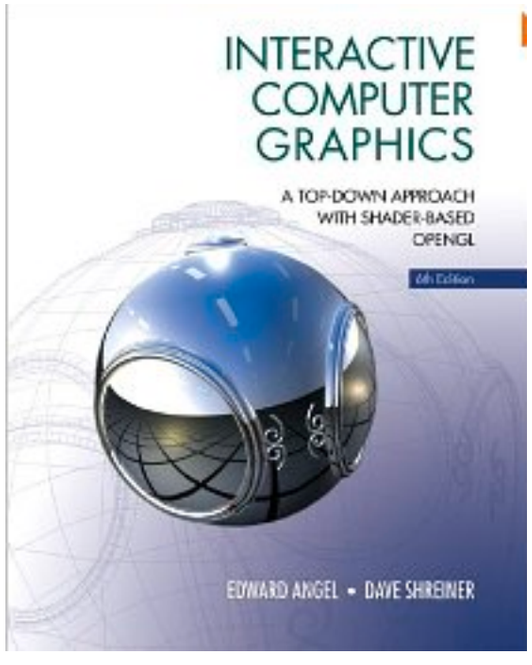


Fundamentals of Computer Graphics

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

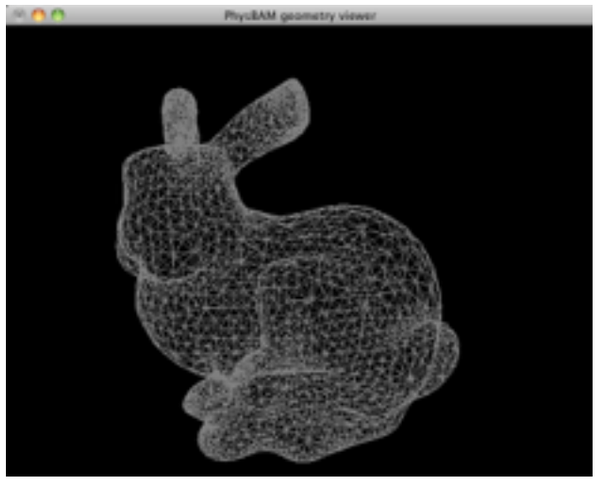
Graphics areas

- **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



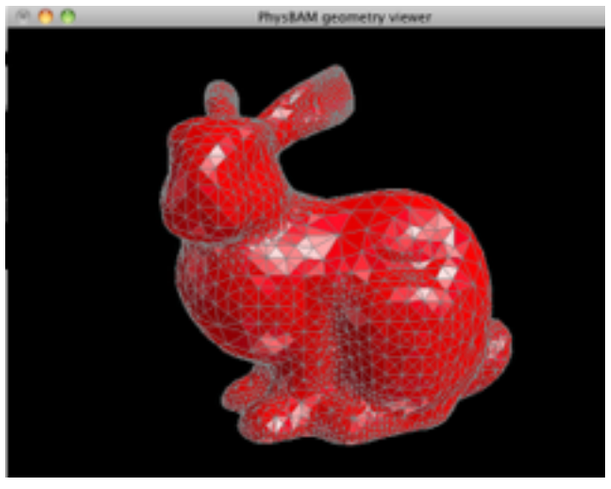
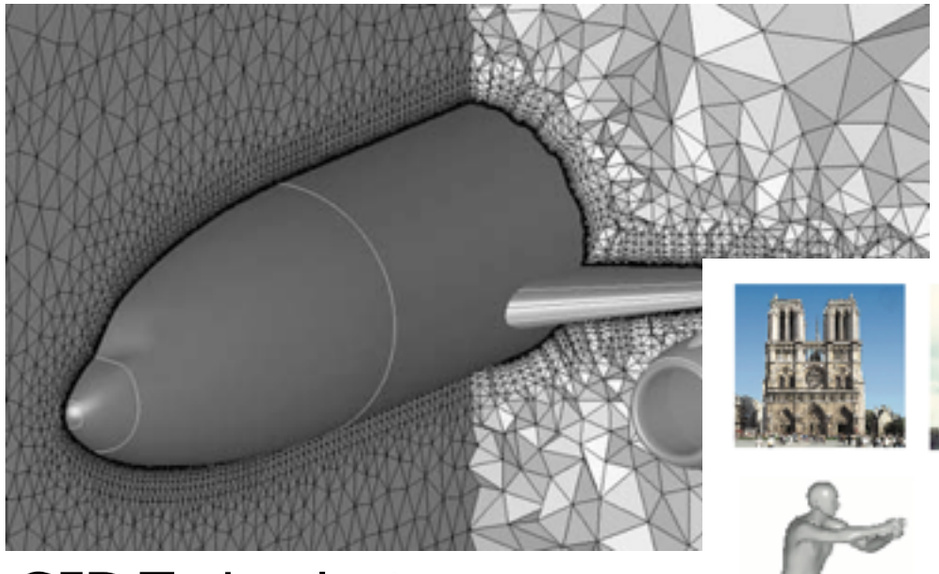


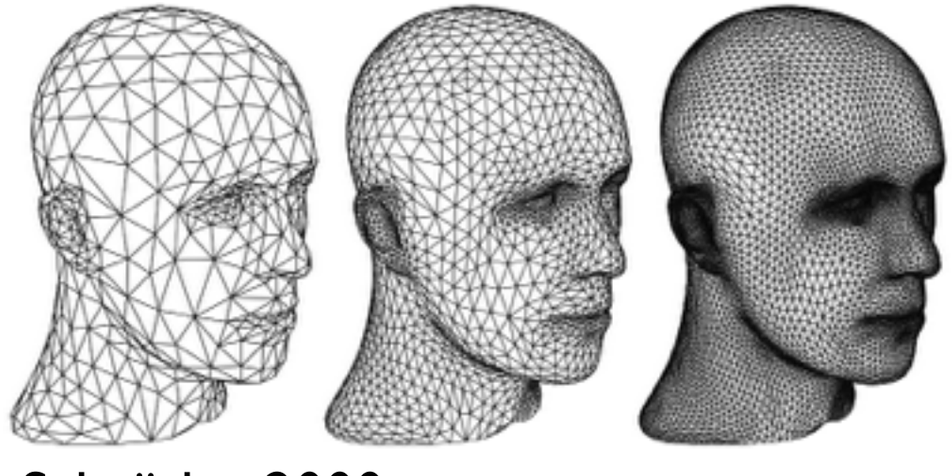
Figure1: Teddy in use on a display-integrated tablet.

Igarashi et al., 2007



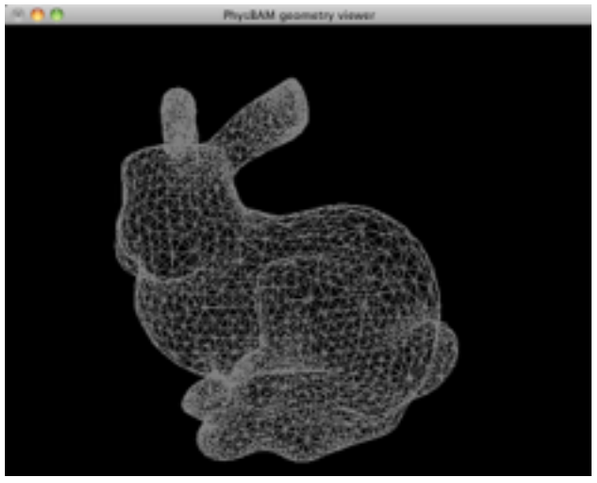
CFD Technologies

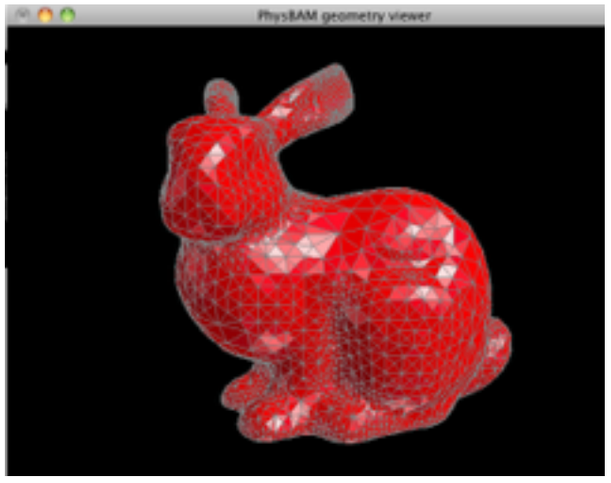
Bronstein et al., 2011



Schröder, 2000

Rendering



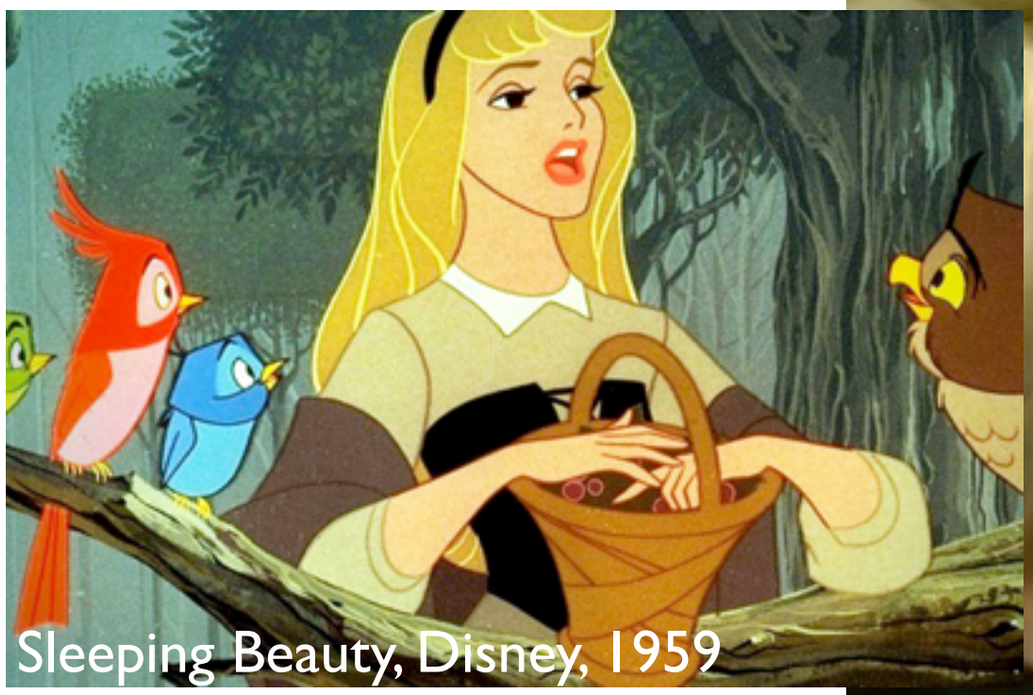


Henrik Wann Jensen

Hong et al. 2007

d'Eon and Irving, 2011

Animation

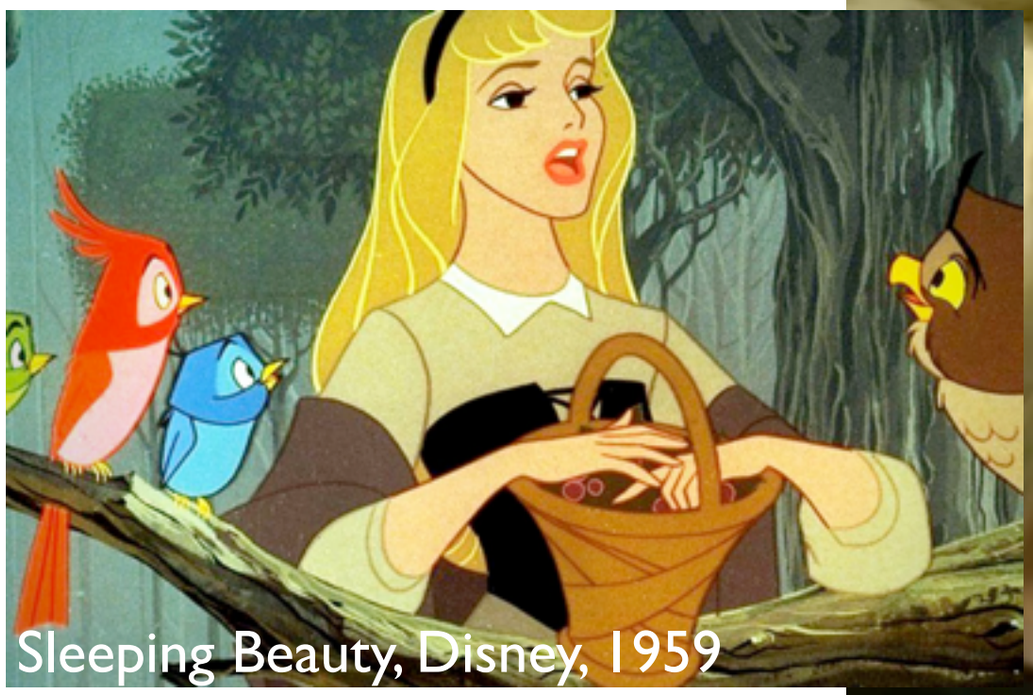

Sleeping Beauty, Disney, 1959


Adventures of Tintin, Weta 2011


Monsters Inc, Pixar, 2001


Life of Pi, 2012

Animation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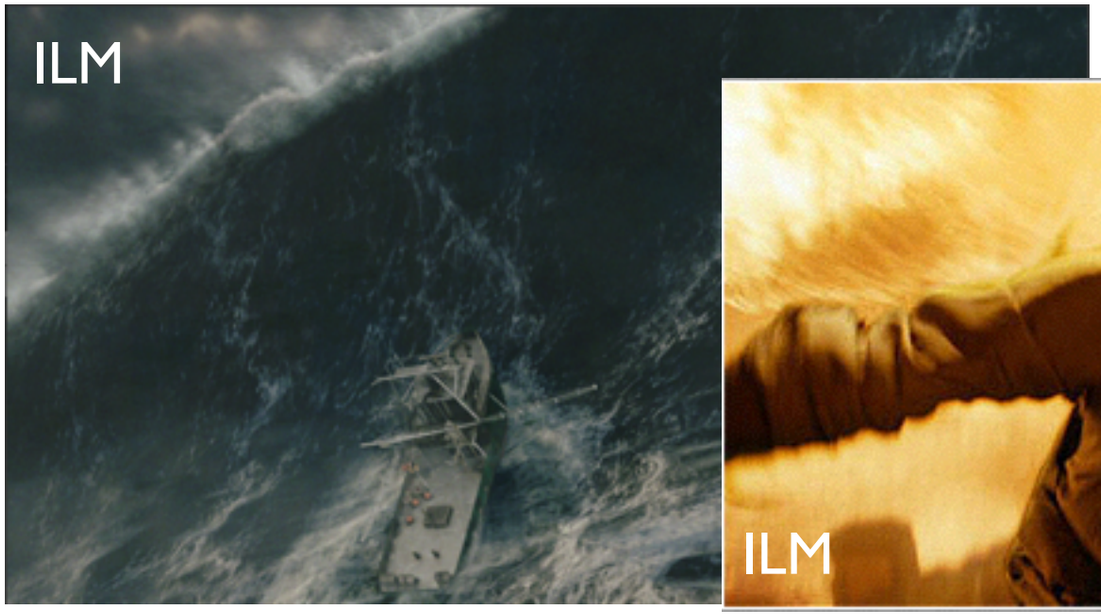
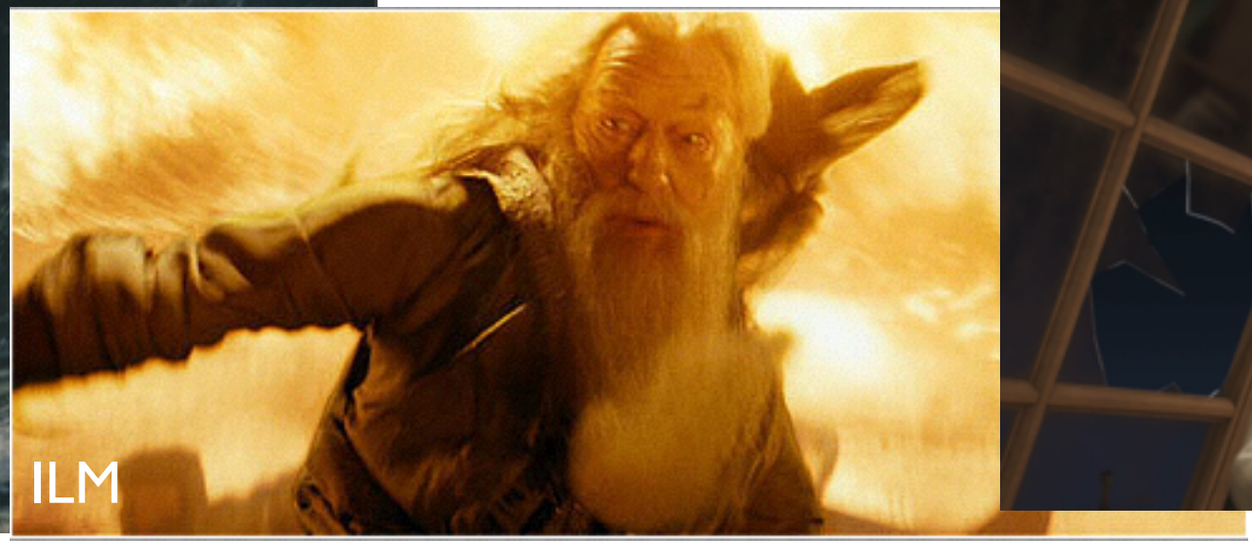
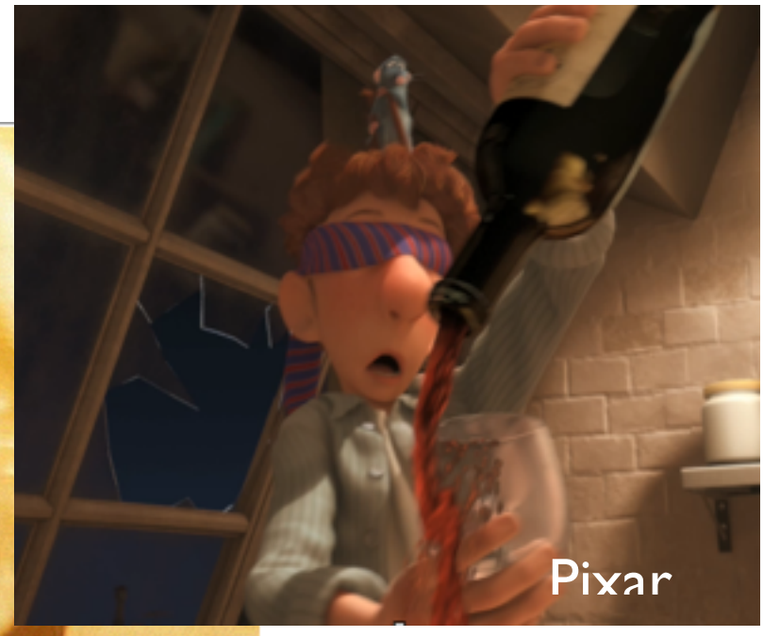
Simulation







Firestorm
Harry Potter and the Half Blood Prince
Industrial Light + Magic

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fluid simulation in Pixar's *Ratatouille*

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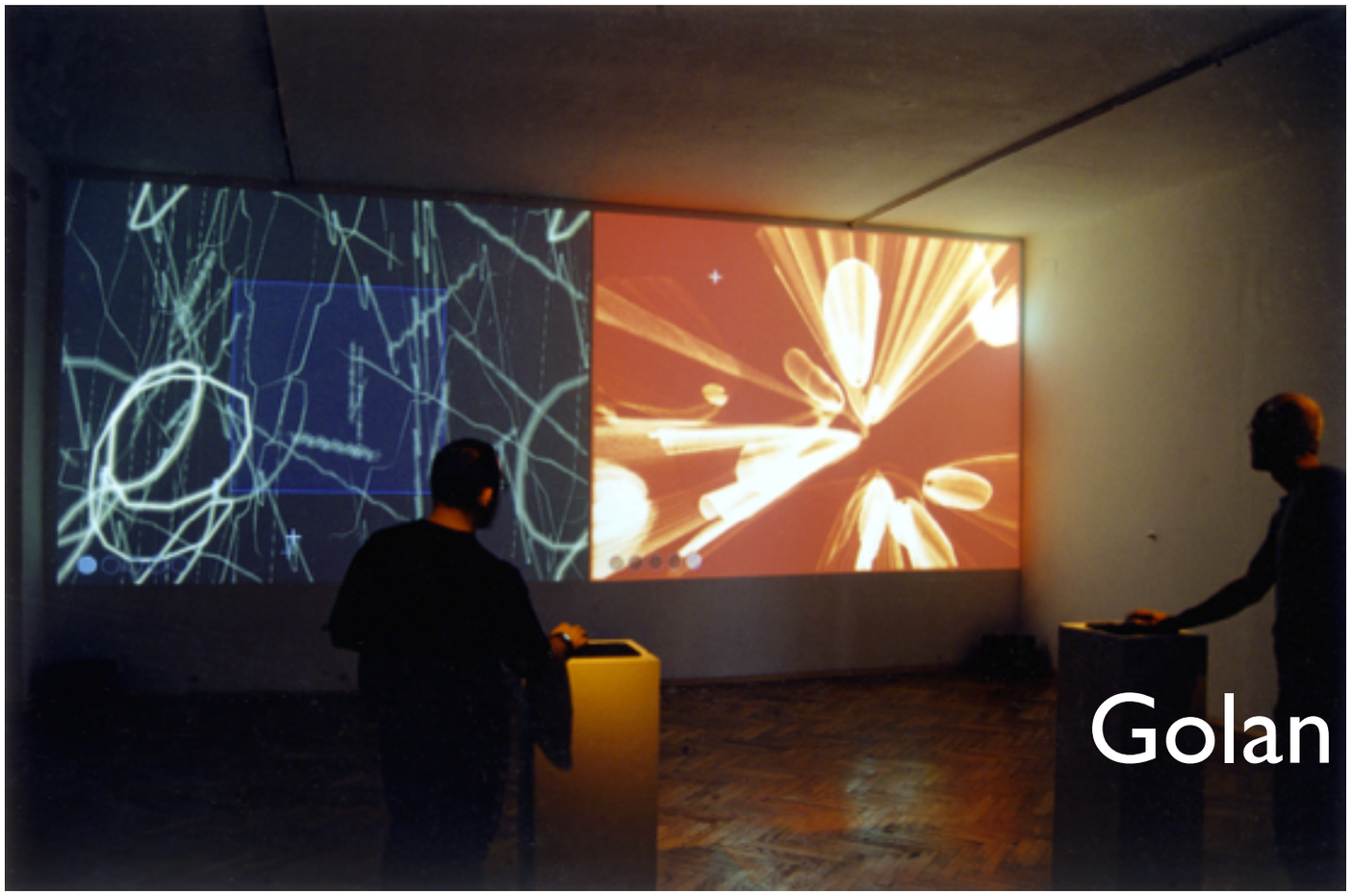
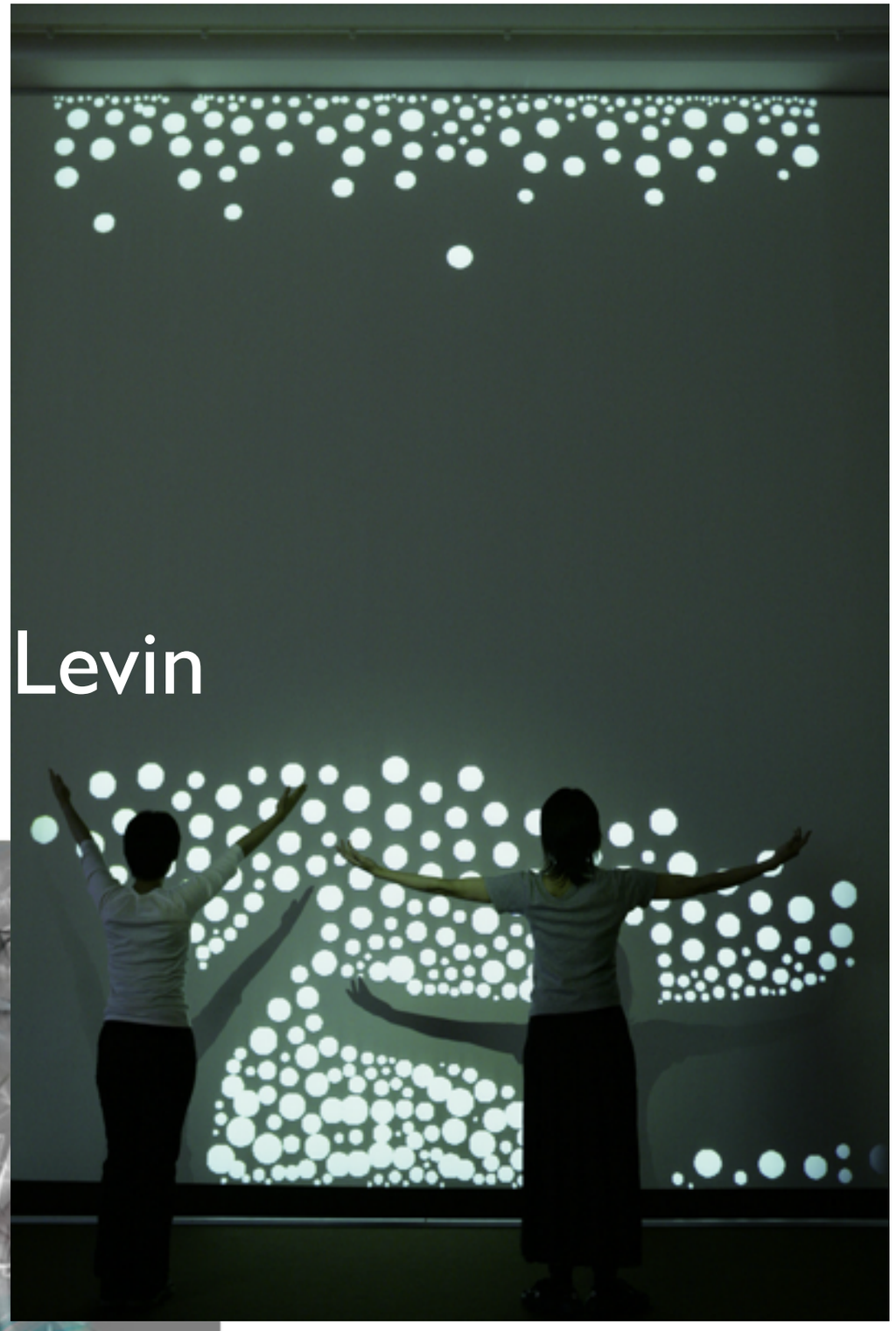
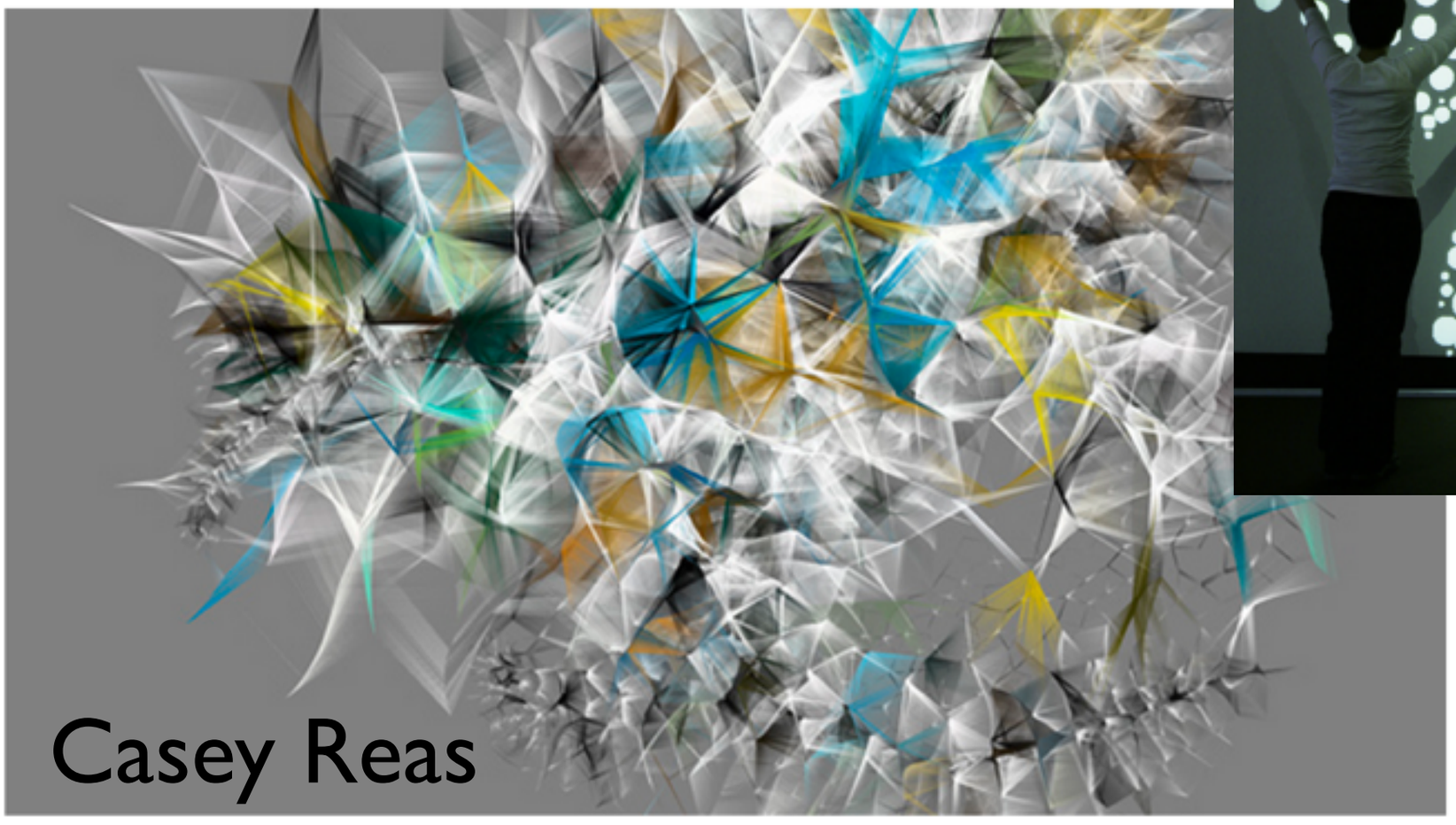


Golan Levin



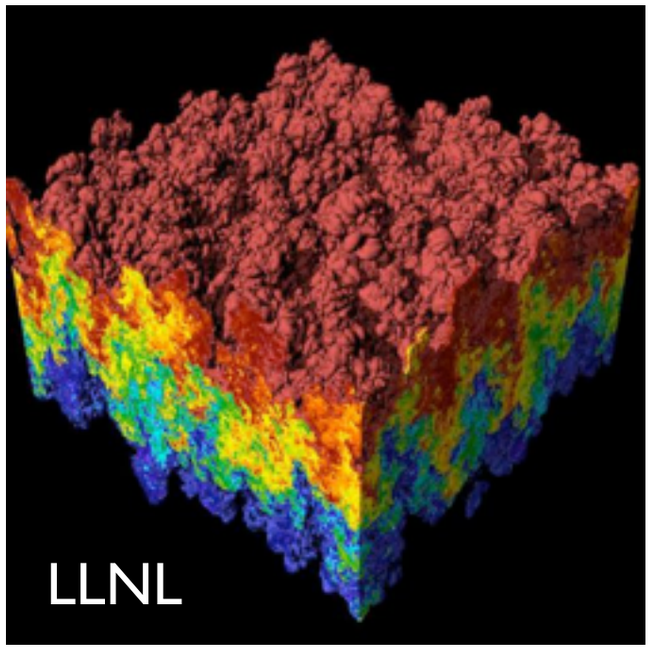


Casey Reas

Other areas...

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


L-1 Identity Solns




Lytro

Microsoft Kinect