Welcome to CS559 “Computer Graphics”

Eftychios Sifakis
Spring Semester 2015
• What is the class about? Is it right for you?
• Discussion of class logistics
  • Timetable, office hours, communication policies
  • Coursework and grading
  • Class materials, website and discussion forum
• Some information about your instructor
• Overview of (tentative) topics covered in class
• Learning a bit about you!
What is the class about?
- Key principles of how computer-generated imagery is created
- Obtain exposure to a number of fundamental concepts
  - Triangles, normals, vectors …
  - Interpolation, splines, meshes …
  - Texture mapping, color, ray casting …
- Gather hands-on experience in implementing moderate-sized programs

Who is this class for?
- Undergraduates excited about graphics and images!
- Formal pre-requisite: CS367 (really … being willing to learn to code)
- Linear algebra not a prerequisite (but we will cover it as needed)
- Textbook [quasi-optional]: Fundamentals of Computer Graphics (Shirley/Marschner)
- Enthusiasm a must!
Logistics

- 3 credits
- Location: Computer Sciences CS1325
- Meeting time: Tuesdays/Thursdays 2:30 - 3:45
- Office hours: Tuesdays/Thursdays 10am - 11am
  - Only on days when the class meets
  - Also by appointment (email!)
  - Check for notes, assignments and reading materials
- Discussion: [https://piazza.com/wisc/spring2015/cs559/home](https://piazza.com/wisc/spring2015/cs559/home)
Logistics

- Factors contributing to your grade
  - In class-midterm, final exam
  - Assignments (programming or paper-and-pencil)
  - Two programming projects
  - Participation, zeal, enthusiasm

- Communication policy
  - Can email anytime - start subject line by [CS559]
  - At the latest, expect reply by next office hours! (usually faster)
  - Try a Piazza post, if one of your colleagues can help!

- Verify that you have received a ping from the mailing list!
  - If not, contact instructor to be added
Topics

• Fundamentals
  • Coordinates/Transformations
  • Basic Shapes
  • Drawing primitives
• Interpolation/Approximation
  • Curves, splines, meshes
  • Vector formats
• Graphics pipelines
  • Lighting/Shading
  • OpenGL
• Image processing
  • Signal processing concepts
  • Synthesis vs. analysis
  • Compression
Research interests:

- Physics-based modeling
- Digital humans
- Simulated elastic objects
- Fluid animation
- Fracture & destruction
- Fast math in general
Animating models of human bodies
Detailed anatomy and complex environments
Jiggly deformable models & fast simulation
Hairy & messy collisions
Fracture, destruction & mayhem
Clinical “skill simulators”
Clinical “skill simulators”
Smoke on the water ....
... and as much detail we can afford

Smoke flow past sphere

Effective resolution: 1Kx1Kx2K

135M active voxels
What about you?

• Your background?
  • Stage in undergrad program?
  • Areas of interest?
  • Favorite classes?
  • Exposure to graphics/programming/building things?

• <insert wish list here>
  • Why interested in graphics?
  • What do you seek in CS559?
  • Excited about specific topic?
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