6.837 COMPUTER GRAPHICS: INTRODUCTION

Jovan Popović
Computer graphics is fun
Computer graphics is big business
Computer graphics helps make things...
...and our houses too
Computer graphics saves lives
Computer graphics leads to new discoveries
Computer graphics is everywhere

Computer graphics as a field
  Definitions, examples

Computer graphics as a course
  Topics, assignments, learning

Bootstrap
  “The screen is a window through which one sees a virtual world.”
COMPUTER GRAPHICS AS A FIELD

Definitions, examples
“The screen is a window through which one sees a virtual world. The challenge is to make that world look real, act real, sound real, feel real.”

Sutherland, 1965
“The purpose of computing is insight, not numbers.”

Hamming, 1962
“If mathematics is queen of the sciences, computer graphics is the royal interpreter.”

F. P. Brooks, Jr., 1962
COMPUTER GRAPHICS AS A COURSE

Topics, assignments, learning
You will learn fundamentals of computer graphics algorithms

Mathematics

- Multivariable calculus and linear algebra

Systems

- Implementation, programming, system design

Big Ideas

- Continuous to discrete, physically-based modeling, simulation
You will *not* learn how to draw or use other graphics applications.

No drawing
  But you can create beautiful art

No graphics applications
  Implement your own Picasa, Photoshop, or Maya

No game engines
  Implement your own
Learning requires reading, practice, and reflection

- Read
- Discuss
- Program

Flowchart showing the process of learning: read, discuss, program, and then read again.
Readings are required from the course textbook
You will create things and creatures with hierarchical modeling and parametric surfaces.
You will simulate physically realistic motions
You will simulate physically realistic images
You will implement interactive application of your choice
“The screen is a window through which one sees a virtual world.” [Sutherland 1965]
Pinhole camera is camera without a lens: the light passes through a tiny hole to reach the film
Computer graphics simulates worlds that look real, act real, sound real, and feel real.