CG

an almost factual account of the history of computer graphics

a long long time ago ...

before buzz ...
before quake ...
before microsloth windows ...
before most of you were born ...
the world existed without computer graphics
inspiration

excited phosphor demo

instant replay

moving electron beam demo

an even less moving moving electron beam demo
society would reap huge benefits …

but that is a different story

a fast draw

filled triangle
but wait … there were lessons to be learned
and it only took

vector vs. raster graphics

meanwhile
back in cambridge

remote control

and a few years later...
and more

meanwhile
back in hollywood

digital compositing
blend parts from different
digital images to create a new image

more famous composites

and more

another technique: warping
morphing

transform one image into another by compositing and warping across time

cs155 fall 2004

computer graphics

2D image processing (synthesis)

meanwhile
back in utah

the lowly triangle

triangle mesh
triangle mesh

stanford michaelangelo project

the graphics pipeline

pipeline: build scene

pipeline: project

pipeline: scan convert

vertices in view plane
frame buffer
hidden surface removal

which is right?

shading

what is color here?

local illumination

the holy grail

photo-realism

ray tracing

- cast ray through pixel into scene
- find intersection point (if any) that is closest to eye
- compute luminance at intersection

luminance

- direct illumination from light sources
  - reflection off surface
  - transmission through surface
  - subject to occlusions
luminance

- direct illumination
- inter-object specular reflection

ray tracing

<scene>
<cone material="glass">
<sphere color="red">
<box color="purple">
<floor material="marble">
</scene>

ray tracing

semi-local illumination

what is wrong with this picture?
the holy grail

photo-realism

radiosity

computer graphics

1. image processing
2. rendering

polygon mesh

surface modeling

computer graphics

1. image processing
2. rendering
3. modeling
4. animation
computer graphics

1. image processing
2. rendering
3. modeling
4. animation

a CS157 film

CS155: Computer Graphics
CS157: Computer Animation

CS155 Prerequisites

• Linear algebra
• C++ programming
• Algorithms & data structures

warning

this class is a lot of work!! drop it now if
- you have a heavy load this semester
- you haven't had the prerequisites
- you aren't a capable programmer

P.S. this class is also a lot of fun!

basic course requirement

you cannot blow off any assignment to pass the class you must submit a solution for each project that successfully implements at least 50% of the assigned features.

course info

www.cs.hmc.edu/courses/year/semester/cs155