administrative
On the Web

http://cs148.stanford.edu

+ piazza

Register ASAP!
Fundamentals of Computer Graphics
3rd edition
Peter Shirley et al.
Course Staff

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Extra credit for regular class participation.
</administrative>
Why Study Graphics?
Why Study Graphics?
Why Study Graphics?
Why Study Graphics?
Why Study Graphics? ...really?

http://www.youtube.com/watch?v=kfVsfOSbJYo
A Perfect Example?

Finally!!!

“It’s Friday. I’m in love.”

Yes!
A Perfect Example?

Image processing
A Perfect Example?

Typography
A Perfect Example?

Transformations
A Perfect Example?

Compositing
A Perfect Example?

Compositing
There’s More!

3D rendering
There’s More!

FRIDAY

WE ➔ WE ➔ WE ➔ SO ➔ EXCITED

Animation
There’s More!

Compression
There’s More!

All done on inexpensive equipment!

Compression
MOVIES WILL NEVER BE THE SAME
Definition

Computer graphics: The study of the digital synthesis of, interaction with, and manipulation of visual content

Adapted from http://en.wikipedia.org/wiki/Computer_graphics
Computer Graphics Pipeline

Input: Consumer devices
Computer Graphics Pipeline

Input: Images and video
Computer Graphics Pipeline

Input: Shape
Computer Graphics Pipeline

Input: Specialized devices

http://images2.fanpop.com/image/photos/11500000/motion-capture-avatar-11559236-1000-1236.jpg
Pixel [pik-suhl]:
The basic currency of computer graphics; a single element of a grid image.
Computer Graphics Pipeline

Processing: “Hand” Modeling

http://fc06.deviantart.net/fs46/i/2009/232/9/e/ZBrush__Head_by_Lepidact.jpg
Computer Graphics Pipeline

Processing: Procedural Modeling

http://www.mpi-inf.mpg.de/~mbokeloh/project_dockingSites/castle.jpg
Computer Graphics Pipeline

“Spacetime Constraints” by Witkin and Kass (1988)

Processing: Animation
Computer Graphics Pipeline

Squash

Stretch

Follow-through

“Spacetime Constraints” by Witkin and Kass (1988)

Processing: Animation
Computer Graphics Pipeline

“Spacetime Constraints” by Witkin and Kass (1988)

Processing: Animation
Computer Graphics Pipeline

Processing: Simulation
Computer Graphics Pipeline

HELLO!
My name is

Stanford Bunny

Processing: Simulation
Computer Graphics Pipeline

Unfiltered source (A)

Filtered source (A')

Unfiltered (B)

Filtered (B')

“Image Analogies” by Hertzmann et al. (2001)
Render [render]:
To generate an image or animation.
Computer Graphics Pipeline


Output: Rendered Frames
Computer Graphics Pipeline

Output: Art
Computer Graphics Pipeline

Output: CAD
Computer Graphics Pipeline

Output: Visualization
Computer Graphics Pipeline

Output: Stylization

http://www.dgp.toronto.edu/~hertzman/ScienceOfArt/cow.jpg
Computer Graphics Pipeline

Output: Interactivity
Computer Graphics Pipeline

Output: Interactivity

http://www.ablesw.com/3d-doctor/headcut.jpg
"As-Killing-As-Possible Vector Fields for Planar Deformation" by Solomon et al. (2011)
The Computer Graphics Pipeline

Output: Combination
Computer graphics is a humongous field.