EECS 487
Interactive Computer Graphics

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Today

Intro to:
- graphics
- me
- this course

What is computer graphics?

"power point" i.e. presentation software

tools to create effective images

visual representations of data (visualization)

2D representation of 3D scenes

DirectX and OpenGL

images for communication

What is computer graphics?

Techniques for creating images with the help of computers

Note: total automation is almost never the goal.

Applications

Mainly:
- Movies
- Games

Both are big-budget industries.

Potential for more apps with lower budgets, non-experts…

Main research areas within graphics

3D graphics:
- Modeling
- Rendering
- Animation

Other:
- Image processing
- Interactive techniques
- More: audio, AI, …

Modeling

How to *represent* 3D shapes
Algorithms for creating or editing shapes

E.g.:
- Spline or subdivision surfaces
- Implicit surfaces
- Particle-based representations
- Image-based rendering

Rendering

Given model of a 3D scene and lights and camera: create a picture

E.g.:
- Illumination models
- Surface reflectance models
- Simulation of light transport
- Local and global illumination

Animation

Could be considered an aspect of modeling, but the subject is huge

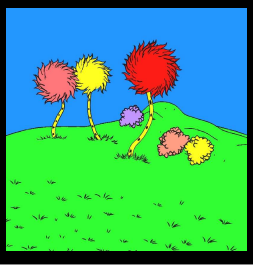
E.g.:
- Character animation
- Physical simulation
- Complex behavior: agents, flocking, etc.

SIGGRAPH videos

Examples of recent work in:
- modeling
- rendering
- animation
- image processing

My work

~~"Non-elephant biology"~~
"Non-photorealistic rendering"



Also: shape modeling

Modeling by drawing
Modeling and rendering not really separable, especially in NPR

Issues:
- abstraction
- level-of-detail
- temporal coherence

NPR going mainstream

See keynote slides by Pat Hanrahan

The future of CG

3 main problems in CS:

1. abstraction
2. abstraction
3. abstraction

Side note

I'm leaving UM after this year.
(Should have published more!)

This course

See course web pages for details…

Notes:

- no discussion this Friday
- 1st project assigned Monday
- discussions designed to help you with projects (will move to lab setting)