Computer Graphics

CompSci 344
Fall 2012
Professor Peck

Class Website

- http://www.cs.duke.edu/courses/compsci344/fall13/wordpress/

What is Computer Graphics?

- Any use of computers to create and manipulate images

www.cs.utah.edu


www.graphics.stanford.edu
Utah teapot

- “The Utah teapot or Newell teapot is a 3D computer model which has become a standard reference object (and something of an in-joke) in the computer graphics community.”

What is Computer Graphics?

- Any use of computers to create and manipulate images

Turner Whitted

- Born in Durham
- First to apply ray tracing in CG
- BSE and MS from Duke
- PhD from NC State
- Adjunct Professor at UNC (1983 - 2001)
What is Computer Graphics?

• Any use of computers to create and manipulate images

[Images of various computer-generated graphics]

www.cs.utah.edu

The Computer Graphics '83, Senden-Kaig Inc, Tokyo, 1982

Computer Graphics

• What are we going to do in CompSci344?
  • learn how CG images are made
    • fundamental algorithms
    • mathematics*
  • make CG images
    • fundamental algorithms
    • mathematics
    • C++ and OpenGL

Logistics

• Textbook

[Image of textbook cover]
Logistics

- Assignments / homework - 45%
- Quizzes - 10%
- Midterm - 20%
- Final project - 25%
  - Project
  - Short paper
  - Presentation - during final

Logistics

- Assignments / homework
  - Due at 11:59pm on due date
  - Late submissions are late
    - Late policy
      - Request 2 extensions - Link on Right side of webpage
      - Request made within 24 hours of due date - gives 72 hour extension

Logistics

- Late policy
  - Assignments may be submitted 1 week late for 1/2 credit
  - Weekends and holidays count toward extensions
Logistics

- Grading
  - 4-point scale
  - Further discussion on Friday
  - Assignment #1 goes out!

Logistics

- Grading
  - Grade errors must be reported within 3 days of grade posting
  - Report errors through the "Grade errors" form on website

Logistics

- Duke honor code
  - Do I have to say anything else about this?
Important dates

- Exam 1 - October 25
- Final - December 14 (2:00pm - 5:00pm)
  - Project presentation / demo

Logistics

- Final Project - 25%
  - Any CG thing you want!
    - Must be approved by me
  - Work in groups
  - Demo / presentation - during Finals
  - Paper - due last day of class

Final Project

- Ideas (think about this throughout the semester)
  - build onto current assignment
  - make a game
  - enter 3DUI Contest
    - http://www.3dui.org/2013/cfp-3dui-contest.html
Major areas of CG

- Modeling - develop mathematical representation of object
- Rendering - process of generating image from model
- Animation - create illusion of motion through sequences of images

- What interests you?

More areas of CG

- User interaction
- Virtual reality
- Visualization

More areas of CG

- Image processing
- 3D scanning - http://www.youtube.com/watch?v=tau6Lam81P4
- Computational photography - UNC Urban space
CG Applications

- Entertainment
- Video games
- Cartoons
- Visual effects
- Animated films

CG Applications

- Design
- CAD / CAM

Training

Simulation

CG Applications

- Information
- Medical imaging
- Information visualization
Final Project

- Use cool tools
  - DIVE
  - Oculus Rift
  - Leap Motion - [https://www.leapmotion.com/](https://www.leapmotion.com/)
  - zSpace - [http://zspace.com/](http://zspace.com/)

Homework

- OpenGL #0
  - Setup OpenGL and C++
  - Get your first OpenGL program running
  - Post to Piazza
  - Help your classmates!
- Reading
  - Chapter 1 - due next Wednesday
  - (Chapter 2 - Math review)