Computer Science 805
Advanced Modeling Techniques in Computer Graphics
Spring 2007
Syllabus

Instructor
Dr. Timothy Davis
McAdams 303
656-0309
Office hours: T 5:00-6:00, W 3:00-4:00 (or by appointment)
tadavis@cs.clemson.edu

Class Meeting Times
TTh 3:30-4:45 Daniel 303

Course Webpage
http://www.cs.clemson.edu/~tadavis/cs805/

Textbooks


Henrik Wann Jensen, Realistic Image Synthesis using Photon Mapping, AK Peters, Ltd.,
2001. (optional)

Grading
Final grades will be based on programming assignments and a final exam with
appropriate weights based on difficulty. The final may be an in-class test, a programming
assignment, or an in-class presentation.

Letter grades will be based on a 10-point scale.

Class Cancellation
Students are expected to wait for 20 minutes after the class beginning time before leaving
if the instructor is late.

Programming Assignments
Programming assignments will constitute the majority of your grade for the course. Each
of these assignments should follow the guidelines listed below.

- Webpage A webpage with your solution to the assignment must include:
  - description of the problem
  - description of the solution
  - user's guide
  - images produced by your code
• **Submission of Code** You must submit your documented code, along with a makefile, to me by e-mail (more details later).

• **In-class Demonstration** For some projects, you will be required to create a presentation for the class that shows the images you produced and explains some of the problems you encountered.

• **Late Work** Late assignments will be accepted with penalty deemed appropriate.

• **Independent Work** You must work on projects independently. Cheating of any kind will not be tolerated and will result in significant penalties.

**Course Description**

The course will cover computer graphics methods, data structures, analysis of algorithms, and selected implementation examples, generally coinciding with the main programming projects assigned throughout the term.

• **Basic Ray Tracing**
  - ray/sphere and ray/plane intersection
  - viewing planes
  - shading and illumination, shadows
  - data structures
  - ppm files

• **Intermediate Ray Tracing**
  - ray/polygon and ray/quadric intersection
  - spherical inverse mapping, convex quadrilateral inverse mapping
  - reflection and refraction
  - bump mapping

• **Advanced Ray Tracing**
  - antialiasing
  - distributed ray tracing
  - soft shadows
  - motion blur
  - depth of field
  - acceleration techniques
  - bounding volumes

• **Other Topics**
  - photon mapping
  - fractional Brownian motion
  - particle systems
  - Lindenmayer systems