

CSE 781 Introduction to 3D Image Generation Winter 2008

Instructor: Han-Wei Shen (hwshen@cse.ohio-state.edu)

Class: MWF 9:30am-10:18am, DL 266

Tentative Office hours: MW 10:30-11:30 pm DL 789

Grader and grader office hours: TBA

Grading:

- Labs and Final Project: 50%
- Midterm Exam: 20%
- Final Exam: 30%

Prerequisite: CSE 581 or 681, knowledge of OpenGL, strong C/C++ programming skills, or permission of instructor

Course Contents: Graphics pipeline; raster graphics algorithms, anti-aliasing, texture mapping; advanced shading and lighting; shadow algorithms; visibility and occlusion culling; programmable hardware algorithms.

Textbook: Advanced Graphics Programming Using OpenGL by Tom McReynolds and David Blythe, Morgan Kaufmann

Reference books:

- Real-Time Rendering, by Tomas Akenine-Moller and Eric Haines, 2nd edition, AK Peters
- OpenGL Programming Guide (The Redbook), Addison Wesley
- OpenGL Shading Language, By Randi J. Rost, Addison Wesley

Tentative Class Schedule:

Week	Topics
1	Course Overview OpenGL overview OpenGL rendering pipeline
2	Special topics on transformation, projection, and rasterization Geometry representation and data structures Quaternions and virtual trackball Lab 1 out
3	Real time shadowing algorithms: planar shadow, shadow volumes, shadow maps
4	Programmable Graphics Hardware – OpenGL Shading Language; Vertex and Fragment Programs Lab2 out
5	Advanced lighting and shading
6	Advanced texture mapping I – bump mapping and environment mapping Midterm exam Lab3 out

7	Advanced texture mapping II – projective texture mapping, antialiasing. Real time reflection
8	Optimization – Occlusion culling techniques; OpenGL optimization
9	Non-photorealistic rendering
10	Advanced topics Final project due